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Planning and Assessing Word Production to Support Lexical Spelling Learning in Grade 1

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Abstract

Learning to spell is a major challenge for beginning writers because they have to develop a great deal of knowledge. Teachers are faced with a challenge as well in that they have to plan the words to be studied and assess the skill level of their students by analyzing the words they produce. The objectives of this study were to measure the lexical spelling success rate of French-speaking Québec students in grade 1 (6-7 years old) in certain spelling fragility areas, to describe the spelling variations that appeared and to discuss the relevance of planning and assessing word production. The research was conducted with 172 students (82 girls and 90 boys) from nine classes in one public urban elementary school. They were administered a dictation exercise using words selected with various criteria. The analysis was conducted on a corpus of 2076 words produced. The researchers then calculated the spelling success rate and the percentage of errors, in addition to doing a fine-grained analysis of the phonographic, orthographic and morphographic productions and the types of errors made (omission, substitution, addition and displacement). The results highlighted changes under way. They also showed that the success rate varies according to the spelling fragility areas being targeted and, surprisingly, that the rate fluctuates for the same fragility areas. The dictation used seems to be an "economical" tool for various reasons, among others because it is easy to administer (requires little time) and the spelling success rate is easy to determine.

Keywords: lexical spelling, word production, spelling fragility areas, grade 1

1 Introduction and Objectives

Because of its impact on almost all school subjects, written French is central to what elementary school students learn, in addition to playing a key role in academic success. Unfortunately, over the past several years, there have been reports that the writing performance of French-speaking Québec students is weak (Ministère de l'Éducation, du Loisir et du Sport du Québec [MELS], 2012) and that they face multiple problems, particularly with regard to lexical spelling (Lefrançois et al., 2008; Stanké et al., 2015). Learning this type of spelling poses a major challenge for students, for in accordance with *Triple Word Form Theory*, it requires that they develop and coordinate multiple sources of knowledge about words, namely, phonological, orthographic and morphological knowledge (Bahr et al., 2009; Bowers & Bowers, 2018; Castles et al., 2018). To verify this knowledge, it is necessary to note students' orthographic successes and not only the errors they make, as usually occurs in the classroom (MELS, 2011). The challenge of lexical spelling must also be met by teachers for they have to take into account language abilities as a whole when they plan their teaching and assessment activities (Masterson & Apel, 2014; Plisson et al., 2010).

The context of this article is the learning of lexical spelling by young students. It is part of a project whose objectives were: 1- to measure the lexical spelling success rates of French-speaking Québec (Canada) students in Grade 1 of elementary school (6-7 years old) in certain spelling fragility areas (i.e., areas considered difficult); 2- to describe the spelling variations that appeared in fragility areas that were poorly written; and 3- to discuss the relevance of planning and assessing word production in order to support the learning of lexical spelling.

1.1 Learning Lexical Spelling

To write a word, the writer must comply with standard spelling, which requires activating various language abilities linked to three components.

Studies describing the early learning of writing have demonstrated the importance of the phonographic component, that is, the component in which apprentice writers discover and use the alphabetic principle (David, 2003). It is the first component used by students (Sprenger-Charolles et al., 2003) and it refers to the transcription of phonemes into graphemes (Catach, 2005). Students thus establish links between the sounds they hear when they pronounce a word and the letters used to transpose these sounds through writing. This conversion plays a determining role in learning how to spell (Castles et al., 2018); however, it reveals spelling fragility areas, or areas where students are more likely to make mistakes (Ho-Dac et al., 2016; Kartoozian, 2017), because certain phonemes can be transcribed in different ways (Pérez, 2014) (e.g. the phoneme [o], which can be written *o* in the word *c**o**chon - pig*, *au* in the word *ch**au**dron - cauldron* or *eau* in the word *gât**eau** - cake*). Phonographic errors are those that do not comply with the phonological form of words (e.g. a student will write *ch**e**dron* instead of *chaudron - cauldron*).

Students may also refer to the orthographic regularities of each word (e.g. if a student wants to write the word *pomme - apple*, they must know that the consonant *m* is doubled); they may also refer to different orthographic patterns they know (e.g. positions in which various graphemes appear). This sensitivity to conventions has been demonstrated among both English-speaking and French-speaking students (Pacton et al., 2001). Errors linked to the orthographic component are consistent with pronunciation, but they do not follow the orthographic form of the word (e.g. *cerize* instead of ceri**s**e - *cherry*) (Fayol, 2008).

Lastly, the morphographic component refers to the transcription of morphemes, which are the smallest units of meaning in oral language. It serves to indicate, in writing, grammatical

elements (feminine, plural, verbal inflections) as well as lexical elements (belonging of a word to a lexical family) through the addition of one or more essentially "silent" letters (e.g. the final and silent *d* of *renard* - *fox*) (Catach, 2005). Some studies have shown that morphological aspects have an early impact on spelling acquisition (David, 2003); however, these aspects are observed to a greater extent among older children (Sénéchal et al., 2016).

The types of errors made may also be taken into account in order to gain a better understanding of misspellings. For example, some errors are related to substitution (*vol**k**an*), while others are related to omission (*vocan* - *volcano*), addition (*vol**e**can* for *volcan*), or inversion (*v**l**ocan* in place of *volcan*) (Boissière et al., 2007). These sub-categories are intended to identify specific sources of potential problems in French spelling.

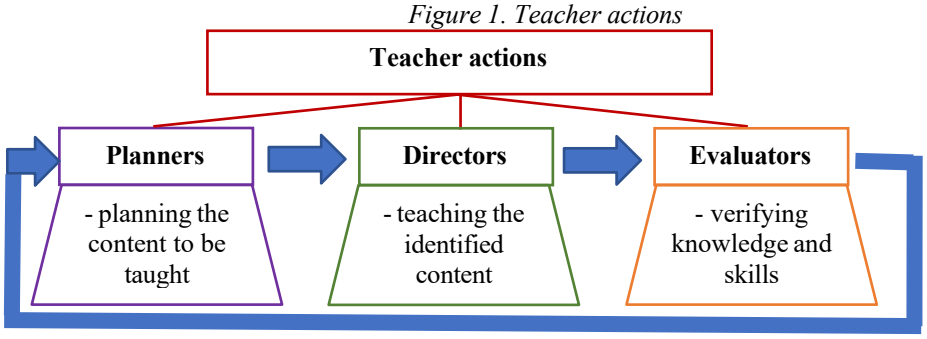
Various studies have also analyzed the errors of French-speaking students. For instance, Joye et al. (2022) have described and compared spelling mistakes made by students in grades 1 to 5 of elementary school. Godin et al. (2018) repeated this same exercise among students with or without developmental language disorder (DLD) in Grade 2 of elementary school. Pérez (2016) studied spelling fragility areas in French spelling with future school teachers, while Katoozian (2013) and Masseron and Luste-Chaa (2008) studied errors in the context of French as a foreign language. In our study, we specifically targeted beginning writers in Grade 1.

The various categories (orthographic components) and sub-categories (types of errors) described are good indicators for interpreting in their entirety the complexity of the students' lexical spelling performances. Therefore, the words produced will be examined on the basis of these indicators. Certain characteristics of words pose a major challenge for young writers. Consequently, when planning to teach spelling, they must be identified in order to determine the spelling complexity of the words that are to be worked on and the areas in these words that are most susceptible to error (Pérez, 2014). In a systematic research review, Wolter (2009) highlighted the importance of the three components related to lexical spelling and said that interventions that take them into account improve students' orthographic productions. Therefore, they should be considered in the planning of teaching and assessment (Bahr et al., 2012; Masterson & Apel, 2010).

1.2 Teaching Lexical Spelling

Teaching practices, or pedagogical practices, refer to the actions of teachers that aim to support students in the construction of knowledge and the development of skills (Clanet & Talbot, 2012; Talbot, 2005). Among the vast array of actions available, some are linked to the teaching-learning situation (Figure 1), which can be boiled down into three successive and interconnected phases.

Figure 1. Teacher actions



In this study, we will concentrate on planning and assessment.

1.2.1 Using Productions for Planning Purposes

Learning lexical spelling requires planned teaching that leads to intentional learning (Pacton & Afonso-Jaco, 2015; Perruchet & Pacton, 2004). Studies have shown that word lists are a practice often used to work on learning this type of spelling: teachers choose a certain number of words to be studied, and they present them to their students so that they can learn how to spell them over the following week (Daigle & Bastien, 2015; Dockrell et al., 2015; McNeill & Kirk, 2014). Other studies have shown that if students are to memorize and retrieve words, the latter must be identified and organized by the teacher before they distribute them to their students (Cogis, 2005; Sautot, 2002). The way in which the words are organized is based on various criteria, such as their usefulness and frequency of use, the presence of shared features (e.g. a sound or a spelling pattern (Brissaud & Cogis, 2011; Daigle & Bastien, 2015; McNeill & Kirk, 2014) or their characteristics (e.g. phoneme-grapheme correspondence, presence of a silent letter, number and types of syllables) (Rieben et al., 2005; Daigle & Bastien, 2015).

Therefore, planning the teaching of spelling involves choosing words. Some studies have asked teachers about this. The teachers' answers showed that the sources they used were varied (Daigle & Bastien, 2015; McNeill & Kirk, 2014), but that the words were usually taken from official documents (e.g. spelling list, MELS, 2014), teaching kits or readings to students. All of these aspects revealed by the teachers shed light on the teaching practices used to teach and learn lexical spelling, including the consideration of certain characteristics of words that appear somewhat similar to the components of lexical spelling. However, no indications were provided for identifying fragility areas in words based on spelling components in the planning process and for taking them into account during assessment.

1.2.2 Assessment: A Requirement for Teaching and Learning

Another teacher action is related to the assessment of learning. It can be noted that teachers with effective practices conduct assessments based on goals that are directly linked to learning. In fact, they assess the content that has been planned and taught, which enables them to adjust and modify their actions according to the progress made (spelling success) or to their students' learning difficulties (types of errors). Assessments thus inform teachers about their future planning and inform students about the state of their knowledge construction (Talbot & Arrieu-Mutel, 2012).

A variety of tools are used to assess lexical spelling; however, word dictation, which is very popular in the school system, plays an important role in this area (Gonac'h, 2015). Spelling correction is usually based on a binary scoring system where the writing of a word is considered to be right or wrong (Fayol, 2008; Masterson & Apel, 2014), without taking into account the three dimensions of language (Masterson & Apel, 2010). The scoring instructions for the assessments proposed by MELS (2011) are in keeping with this approach. Teachers have to determine the number of words that do not comply with the standard lexical spelling. This correction method is fast, but it does not highlight the skills shown by young writers in their productions (Mauroux & Garcia-Debanc, 2013) and provides no information on the spelling success rates in certain fragility areas (Ho-Dac et al., 2016).

In this study, we will examine the standard and non-standard forms that appear in a dictation of words produced by beginning writers and provide teachers with food for thought on the planning and assessment of spelling tasks.

2 Methodology

2.1 Type of Research

We took a descriptive look at the data in order to determine the spelling success rate in the fragility areas identified, as well as the frequency and types of errors made in those areas. We opted for a limited corpus and a somewhat qualitative analysis of the word productions.

2.2 Participants

A total of 172 (82 girls and 90 boys) French-speaking Québec students in Grade 1 (6-7 years old), attending nine classes in one public urban elementary school, took part in the study. The students making up our sample are those whose teachers have agreed to participate in the study. Written authorization and signed consent was obtained from the parents for all study participants. The consent of school principals was also obtained.

2.3 Data Collection

Before the activity was held in the classroom, the experimenter was informed of the procedure to be followed and the words to be dictated using pictures representing the words. During the activity, they presented the pictures one at a time, dictated the word that was to be written down and left the students enough time to produce the word on their sheet. It took 30 minutes to complete the activity. The students were required to carry out this task in class, at the end of the school year (month of May). They were given a sheet of pictures on which they had to write the corresponding words.

2.4 Measurement Tool

A dictation was chosen as the measurement tool because it is an activity that is carried out regularly in the classroom even with young students. It was also chosen because it is a production task with constraints, in which all students must write the same words (Pérez et al., 2012). They can thus focus their attention on lexical spelling. The dictation included 12 words with a number of fragility areas that had been identified beforehand.

2.4.1 Words Chosen for the Dictation

Words that the students knew orally were chosen for the dictation (Daigle et al., 2015) based on the three components of lexical spelling: (a) the phonographic component (consistent words, whose phoneme-grapheme association is unequivocal); (b) the orthographic component (words with certain special features: double letters); and (c) the morphographic component (words with silent letters). In addition, to ensure that the target words selected were not too difficult or too easy, the lexical spelling development scale ÉOLE (échelle de développement en orthographe lexicale) (Pothier & Pothier, 2004) was consulted. The spelling success rate for the words selected averaged 50%, indicating that there were varying degrees of difficulty.

Certain aspects of French spelling were identified as being very susceptible to variation (Manesse & Cogis, 2007), and thus as spelling fragility areas. Among those aspects we decided to observe: the transcription of multi-graphemes (phonemes that can be written in several different ways) [o], [ɛ] et [ɑ̃]; the silent derivative letter *t*; the paired consonant *ss* and the ending *ée*, where the *e* acts as a *lettre-hors-système* (outside-of-system letter). These aspects are likely to pose problems for beginning writers. The dictation included two

words containing all of these features in order to verify whether these same spelling variations appeared in both words.

2.5 Data Analysis

The analysis examined a corpus of 2076 words produced by the students as a whole. First of all, the words were analyzed with regard to how accurately they were spelled (success rate). A score was assigned by comparing how many words in each identified fragility area complied with the standard spelling versus the total number of words. Students obtained 0/1 if the fragility area did not comply with the standard spelling and 1/1 if it did comply. An average was then calculated for the students as a whole. The frequency of errors based on the different spelling components (i.e. phonographic, orthographic and morphographic components) and the types of errors (omission, substitution, addition and inversion) were noted in order to analyze the deviations from the standard spelling.

3 Results

3.1 Spelling Accuracy

Each of the words produced was examined. Table 1 presents the number of students who accurately spelled each of the fragility areas identified.

Table 1. Properly spelled fragility areas (and percent) [1]

Spelling fragility areas	**Number of students who spelled the area properly**
1- in jardin (garden) gradin (bleacher)	 140 (80.9%) 155 (9.59%)
2- an ruban (ribbon) écran (screen)	 122 (70.52%) 107 (61.84%)
3- t chat (cat) rat (rat)	 164 (94.79%) 71 (41.04%)
4- ss ruisseau (brook) dessin (drawing)	 50 (28.9%) 83 (47.97%)
5- ée poupée (doll) bouchée (mouthful)	 89 (51.44%) 15 (8.67%)
6- au saumon (salmon) chaudron (cauldron)	 46 (26.58%) 40 (23.12%

[1]N=*173*

A total of 1096 standard forms were observed in the 2076 words produced, which represents an average accuracy rate of 52.79%. The most accurately spelled fragility areas involved the transcription of the multigraphemic phonemes [ɛ] and [ɑ̃] (89%). Positive results were also observed for the silent letter *t* (almost all of the students were able to accurately write the word *chat* (164), while close to half successfully wrote the word *rat* (71)), as well as for the silent letter *e* (89 students wrote the word *poupée* properly). In addition, a fairly large proportion of students understood that some words require a double consonant (nearly 40% for the *ss* in *ruisseau* and *dessin*).

In fact, we noted that the success rate varied on the basis of the fragility areas and the

words selected. Some results were very different for the same area. This was the case of *poupée* = 51.44% and *bouchée* = 8.67%, as well as for *chat* = 94.79% and *rat* = 41.04%.
The lowest success rate was associated with the transcription of the phoneme [o] (success rate of 24% for the two words), which was written mainly with the grapheme *o*, but which should have been written as *au* in the dictation. It was more difficult to choose the right grapheme in that case.

3.2 Deviation from the Standard Spelling

When fragility areas were not spelled properly, it was useful to specify the lexical errors that were made. The variations in the spelling of words in the fragility areas were counted and coded in a frequency distribution table based on the spelling component and types of errors involved (Table 2).

Table 2. Frequency of errors in the spelling fragility areas identified

Spelling components	**Types of errors**				
	Substitution	*Omission*	*Addition*	*Inversion*	*TOTAL*
Phonographic	76	205	24	8	313
Orthographic	400	126	0	0	526
Morphographic	57	47	60	0	164
TOTAL	533	378	84	8	1003

There were a total of 1003 variations, 31.2% (313) of which were phonographic variations, 52.4% (526) orthographic variations and 16.4% (164) morphographic variations. This latter result is interesting in that it expresses a certain sensitivity to this aspect of spelling (particularly silent letters) that can be observed in substitutions and additions as of Grade 1.
With regard to the phonographic component of spelling, the table shows that when students did not write the target fragility areas properly, a trend toward "omission" errors emerged (N= 205). Such errors occurred primarily for the words *ruisseau* and *dessin*, in which students forgot to write an *s*, thus altering the phonological structure of the word (*ruizeau*, *dezin*). The main error noted with regard to phonographic substitutions (N = 76) was the changing of the phoneme [o] in the word *chaudron* for the phoneme [ə] (*chedron*), indicating a possible confusion with oral language and poor processing of phonological information.
In regard to spelling, we also observed that substitution errors predominated (N = 400), followed by omissions (N = 126). For example, when the phoneme [ɑ̃] was not written properly in the words *ruban* and *écran*, it was usually written *en* rather than *an*, whereas in the words *saumon* and *chaudron* students opted for the letter as *o* or the grapheme *eau* in order to transcribe the phoneme [o]. In other words, the words produced were phonologically acceptable, but the graphemes chosen to represent the phonemes were inappropriate. Omissions were observed in the words *poupée* and *bouchée*, with the *e* being absent. It is also interesting to note that no errors related to orthographic additions were observed.
Lastly, the type of errors made with regard to the morphographic component was more varied and can be broken down into substitutions (N = 57), omissions (N = 47) and additions (N = 60). For example, in the word *chat* and especially the word *rat*, the silent derivative letter *t* became an *s*, an *e* or a *z*, making the orthographic form unconventional but plausible. This was also the case of the additions noted in a large proportion of the words where an *s* (grammatical morphogram, written plural mark) or a *t* (lexical

morphogram, derivation mark) could be added at the end of words, thus interfering with their spelling but not with their phonology. It can also be noted that the silent letter was omitted (e.g. *cha*, *poupé*) in some of the words produced.
In addition, inversions were observed only in the form of phonographic variations and concerned only the sound *in* where the letters *n* and *i* was transposed (jard*ni*).

4 Discussion

4.1 How Do Beginning Writers React to Spelling Fragility Areas?

To answer this question, we first sought to draw attention to the success rate of Grade 1 students in various spelling fragility areas that first grade teachers had worked on during the school year. This provided information on the strengths of those beginning writers up to the end of the school year. The results show that the students had a fairly positive reaction (overall success rate 52.79%) to the areas that were verified. They were able to deal with multigraphemic phonemes (*in* and *an*) (Catach, 2005; Daigle & Montésinos-Gelet, 2013) and select the most plausible spellings in the context of the words that were dictated. As demonstrated by some studies (Joye et al., 2022; Sprenger-Charolles et al.,1998), graphemic complexity has only a temporary impact on spelling productions, but it gives rise to difficulties during the very early stages of learning. The students were also confronted with words containing final silent letters. These results are interesting because these letters gradually earn their place in words (production of the *t* in *chat* = 94.8% and in *rat* = 41%; and production of the *e* in *poupée* = 51.4% and in *bouchée* = 8.7%). The students understood that these letters play a specific role at the end of words. This concern with morphology is not always expressed correctly (e.g. *rat* = *ras*). It can reflect skills in derivational morphological regularities, when the error is related to the substitution or addition of a silent letter, or it can testify to more limited knowledge in this regard, when the error is related to the omission of a silent letter (Pacton et al., 2005; Sénéchal et al., 2016). These spelling productions can also be surprising given students' different reactions to words that are similar to each other and share the same fragility areas. The variance in the results reflects not only a known difficulty related to silent letters (Joye et al., 2022; Peereman et al., 2007), but especially the problems that students face in transferring their knowledge about one word to another one with similar characteristics. A larger corpus of words including these fragility areas would be needed to better verify this knowledge transfer question.
All of the errors coded in our sample (N = 1003) could be associated with one of the three components of spelling phonographic, orthographic and morphographic components) and one of the types of errors (substitution, omissions, addition and inversion). This range of non-standard orthographic forms highlights how important it is for teachers to know the French spelling system so that they can properly interpret what is written, as well as how important it is for students to acquire not only phonological and orthographic skills but also morphological skills in order to produce words in Grade 1. As in the study by Joye et al. (2022), it was also demonstrated that orthographic variations are predominant in first grade. They result in numerous substitutions (confusion with another grapheme) that can reflect a plausible choice of grapheme (*en* instead of *an*) or a simpler choice (*o* instead of *au*). These data should be enriched by students' verbalizations to make it easier to better understand the choices they made. Lastly, as in other studies (Godin et al., 2018; Plisson et al., 2013), there were very few "inversion" errors even though this type of error was frequently observed in Grade 1 (Joye et al., 2022). This low rate seems to be an indicator of appropriate handling of phonological information.

4.2 How Can the Analysis of Written Productions Provide Teachers with a Planning and Assessment Perspective?

Looking at students' written productions leads us to look at the work that teachers do in order to plan and assess their students' orthographic skills. Performance analyses must be developed using specific orthographic elements. These elements act as indicators of students' lexical spelling abilities and are likely to highlight the orthographic resources at their disposal and the support they need. To that end, teachers must not only correct the students' productions; they must also interpret them. Analyzing students' strengths and difficulties makes it possible to ask questions about why errors are made, to target problematic fragility areas and to reflect on what types of activities should be planned and conducted with the entire class, a sub-group of students or individual students to better support the development of orthographic abilities. For example, a teacher who analyzed the words *saumon* and *chaudron* could plan a lesson on the multigraphemic phoneme [o] since most of the students did not write this phoneme correctly in the dictated words. This interpretive perspective is important, but not always easy to adopt, because doing such precise assessments requires in-depth knowledge on the orthographic code, as well as time, which is something that teachers don't always have. This time variable will also have an impact on the planning of orthographic tasks that should be linked to what must be taught and verified, together with students' needs.

5 Conclusion

The objectives of this study were to measure the lexical spelling success rate of French-speaking Québec students (6-7 years old) in Grade 1 of elementary school in certain fragility areas, to describe the spelling variations that emerged and to discuss the relevance of planning and assessing word production in order to support the learning of lexical spelling. Although the sample size was a bit small and the list of words a bit short for detecting the different types of errors and for generalizing the results, the latter shed light on the type of abilities that would have led to correct spelling in the fragility areas identified and in the dictation activity that was likely to be repeated in classrooms.

The analysis of writings produced by students usually focuses on spelling errors and draws little attention to spelling accuracy. In fact, this is the approach that we chose for this study. This way of considering word productions highlights changes under way; for example, *t* or *s* was starting to appear at the end of words. It also revealed that young writers at the end of Grade 1 are able to deal with certain spelling fragility areas, are sensitive to morphograms and are able to remember the correct spelling of certain words encountered earlier during reading or orthographic activities. In our opinion, the tool we used (targeted dictation) to reveal the students' strengths is an "economical" tool. It is easy to administer (requires little time), the students write the same words, the spelling success rate is easy to determine, the list of words that need to be checked does not have to be long and the fine-grained analysis of deviations from the standard can be conducted only in spelling fragility areas. However, this type of analysis takes a little longer to carry out than simply correcting a dictation and requires that the fragility areas to be examined are identified beforehand, along with the words that will allow these areas to be observed.

Conducting assessments to shed light on teaching is not new; in fact, it continues to play a meaningful role. Such assessments must be conducted rigorously if they are to gather relevant and useful information for intervening with students.

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