

CURRICULUM-BASED MEASUREMENT IN WRITTEN EXPRESSION  
AT THE SECONDARY LEVEL

by

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ABSTRACT

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The use of curriculum-based measurement (CBM) in written expression is becoming more common in today's schools; however, there is a need for more information pertaining to the technical adequacy of these measures at the secondary level. As a result, this research project examined the current literature related to CBM in written expression. The results of the literature review suggest that indicators of writing performance at the elementary level are not the most appropriate indicators of writing performance at the secondary level, and emerging evidence indicates the need for more complex measures for middle and high school students.

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## CHAPTER 1

### *Introduction*

Writing is an important skill that provides individuals with a way to communicate, an outlet for expression, reflection, and the means to record our history. Writing proficiency does not develop instantaneously; it is a continuous process that adapts and changes with one's experiences and education. The importance of writing in today's society can be seen by its inclusion on graduation tests, college entrance exams, and in the Nation's Report Card (Scierka, Weissenburger, Espin, 2003). Unfortunately, the National Assessment for Educational Progress found that as many as 16% to 22% of our nation's students are not able to write at the most basic level (National Center for Educational Statistics, 1998). Given these results, it should come as no surprise that ways to monitor and assess writing proficiency is of great interest to many educators. One way to monitor and assess writing proficiency is through curriculum-based measurement (CBM).

Curriculum-based measures (CBM) are a standardized set of measures used by special education and general education teachers to evaluate the effects of academic performance in the basic skills of reading, mathematics, spelling, and written expression (Deno, 1985). Deno and his colleagues first developed CBM in the early 1970s as a way for special education teachers to accurately assess and evaluate the effects of instruction (Deno, 1992). Since then, CBM have been applied to an array of situations and populations (Shinn, 1998). However, their primary purpose is still to provide teachers with a tool to help improve student performance (Deno, 1992).

Many characteristics of CBM make it ideal for evaluating student performance. Unlike traditional norm-referenced standardized tests of assessment, CBMs are simple, short-duration

forms of assessment related to the curriculum of interest (Deno, 1985, 1992). They are available in multiple forms, decreasing the likelihood of a practice effects and making frequent administration possible. CBM, thereby, allows teachers to continually assess and monitor the educational growth of their students (Deno, 1986). In addition, CBMs have been found to influence teacher judgment, teaching styles, and student achievement.

Research suggests that teachers who use CBM are more likely to modify curricular programs, respond to student progress, and formulate realistic goals (Fuchs, Deno, & Mirkin, 1984; Fuchs, Fuchs, & Stecker, 1989). Consequently, the use of CBMs generally leads to higher achievement scores in reading, spelling, and mathematics (Fuchs & Fuch, 1986). Accordingly, Espin, Scierka, Skare, and Halverson (1999) found that improvements on specific CBMs could be generalized to broader educational areas. For instance, the number of words read correctly in one minute has been proven to be a good indicator a child's overall reading ability (Deno, Mirkin, & Marston, 1980). Thus, it can be inferred that as children increase the number of words they read correctly, they also are improving their reading fluency, ability to comprehend reading passages, and, ultimately, their broad reading skills. Moreover, research suggests that CBM can be used to identify students with difficulties and influence instructional decisions throughout a child's educational career (Shinn, 1998).

Isaacson (1995) found that early grade writing skills are a good predictor of educational success, and writing skill deficits are frequently the first sign of academic difficulty recognized by teachers. It has also been suggested that early problems with writing often follow children throughout formal education (Isaacson, 1995). Thus, children who have difficulty with writing in elementary school are likely to have problems with writing in secondary school. Consequently, it

is imperative that reliable and valid curriculum-based writing measures be identified at both the primary and secondary level.

Previous research at the elementary level suggests that the number of words written, the number of words spelled correctly, the number of correct word sequences, (Deno, Marston, & Mirkin, 1982; Deno, Mirkin, & Marston, 1980; Shinn, 1998) and the number of correct punctuation marks used in response to a three minute story starters are valid indicators of writing proficiency (Gansle, Noell, VanDerHeyden, Naquin, & Slider, 2002). However, these same indicators do not appear to be the most appropriate measures of writing proficiency at the secondary level (Parker, Tindal, Hasbrouck, 1991; Tindal & Parker, 1989; Watkinson & Lee, 1992). Unfortunately, very little research exists examining the most appropriate indicators of writing proficiency at the secondary level.

#### *Purpose of Study*

The basis of this study is to examine the existing literature on curriculum-based measures in written expression. The primary purpose of this paper is to examine what constitutes CBM in written expression as well as what is known about curriculum-based writing measures at the secondary level. Two research questions were addressed in this study:

1. What is a CBM in written expression?
2. What is known about CBM and writing for secondary students?

#### *Definition of Terms*

Correct Minus Incorrect Word Sequences- The number of incorrect word sequences minus the number of correct word sequences in each portion of a writing sample (Scierka, Weissenburger, & Espin, 2003).

- Correct Punctuation Marks-** Punctuation marks that are in the correct location in the sentence (e.g., a period or question mark appeared at the end of a sentence) and are appropriate for the sentence (Gansle, Noell, VanHeyden, Naquin, & Slider, 2002).
- Correct Word Sequence-**Two adjacent, correctly spelled words that are syntactically and semantically correct and acceptable to a native speaker of the English language (Videen, Deno, & Marston, 1982).
- Curriculum-based measurement (CBM)/Curriculum-based Measures (CBMs)-**Measures that function as critical indicators of academic performance in the basic skill areas of reading, writing, spelling, and mathematical computation (Deno, 1986).
- Holistic Rating-** A score derived from the general impression of an examiner after quickly and subjectively reading through an entire writing passage (Tindal & Parker, 1989).
- Incorrect Word Sequences (ICWS)-** When one or both words in an adjacent two word sequence are syntactically/grammatically unacceptable to a native speaker of the English language (Videen et al., 1982).
- Product-dependent measures-**Measures that assess an individual's writing fluency skills, such as the number of words written, the number of words written legibly, the number of words spelled correctly, and the number of correct word sequences (Tindal & Parker, 1989).
- Product-independent measures-** Measures that assess the grammar and syntax of writing such as percentage of legible words, percent of words spelled correctly, percent



of correct word sequences, and the mean length of correct word sequences (Tindal & Parker, 1989).

Story Starter-A short phrase or sentence used to prompt a student's writing sample. For example, "It was a dark and stormy night" (Shinn, 1998).

Text Coherence- A measure derived from counting the number of events in a causal chain (Scierka, Weissenburger, and Espin, 2003).

Total Words Written (TW)- The sum of words written in a specified amount of time. A "word" is defined as any numeral or letter sequence that is clearly separated from an adjacent numeral or sequence (Scierka et al., 2003).

## CHAPTER 2

### *Review of Literature*

In this chapter, the literature related to curriculum-based measurement in writing is first reviewed. Then, indices used to measure writing proficiency at the elementary and middle school level are examined. Next, the countable indices used with secondary students thus far are addressed. Therefore, the primary focus of this literature review will be to answer the research questions specified in chapter one.

#### *What is Curriculum-based Measurement in Written Expression?*

Curriculum-based measurement in written expression is an assessment device used to monitor students' progress in writing and evaluate the effectiveness of current writing instruction (Deno, 1985; Shinn, 1989). CBMs in written expression are simple, short in duration, fluency measures directly tied to the students writing instruction, which use "indicators" of performance to measure students' growth in writing. To be effective, these indicators must be reliable and valid measures of a student's general writing skills (Espin, et al., 2000). For example, Deno et al. (1980) found that the number of words an elementary child writes correctly in a 3-minute period is a good indicator of a child's broad writing skills. Thus, from these samples, it can be inferred that as the number of words a child writes correctly increases, so do his or her skills in other areas (e.g., punctuation, grammar, sentence structure and story structure) (Espin, et al., 1999).

CBMs in written expression are derived from of short probes or story starters such as "It was a dark and stormy night," or "I stepped into a time machine." Students are typically asked to respond to these parallel probes for 3- to 5- minutes, weekly, biweekly, or monthly depending on the intended purpose of the assessment. Through the consistent administration of parallel writing probes, teachers are provided with information that can be graphed to show writing progress or

the lack there of (Espin et al., 2000). Teachers can then use this information to determine if instructional change is needed, which children are at risk of falling behind, or to simply monitor the progress of their students. For instance, while examining Tommy's graphed data, his teacher notices that his scores on the CBM writing probes have leveled off compared to the rest of the class. His teacher may then decide that the current instructional program is not the right fit for Tommy's learning style or that Tommy simply does not understand what is currently being taught; thus indicating the need for instructional change.

#### *What Measures Should Be Used in Curriculum-based Measurement?*

When developing a curriculum-based measure, one of the most important decisions to be made is what measures should be used (Espin et al., 1999; Fuchs & Fuchs, 1987). First, the measures must be reliable and valid indicators of a student's overall academic performance in the target areas. Second, the measures must be consistent and stable in order to provide educators with continuous information about the effectiveness of their current instruction. Lastly, to ensure their use, they must be easy to administer, easy to score, and easy to understand (Deno, 1985).

Since the inception of CBM in writing, a wealth of research has indicated that by counting a number of indices at various grade levels, educators can gain a sense of a student's general writing proficiency (Espin et al., 1999; Espin et al., 2000; Parker, Tindal, & Hasbrock, 1991; Tindal & Parker, 1989; Watkinson, 1992). The number of words written, the number of words spelled correctly, the number of words written legibly, the number of correct word sequences, and the mean length of word sequences are a few of the indices used to measure a student's general writing proficiency thus far (Weissenburger, 2003). Research, however indicates that the indices used to measure writing proficiency at one grade level may not be the

most appropriate measures of writing proficiency at other grade levels (Parker et al, 1991; Watkinson & Lee, 1992).

*Countable Indices of Written Expression at the Elementary Level*

Many different CBM scoring indices in writing have been examined at the elementary level. The most commonly used indices of written expression at the elementary level have been the total number of words written correctly, the number of words spelled correctly, and the number of correct word sequences (Espin et al., 2000). Previous research has indicated that these measures are both valid and reliable indicators of writing proficiency at the elementary level (Deno et al., 1982; Deno et al., 1980; Videen et al., 1982).

*Total words written and spelled correctly at the elementary level.*

In an effort to ascertain a valid measure of writing proficiency Deno et al. (1980) examined the relations between various indicators of performance and students performance on other previously established systems of measurement, which included the test of Written Language (Hammill & Larsen, 1978), the Word Usage subtest of the Stanford Achievement Tests (Madden, Garden, Rudman Karlsen, & Merwin, 1978), and the Developmental Sentence Scoring System (Lee & Canter, 1971). When compared, the results suggest that indicators such as the number of words written, the number of words spelled correctly, the number of mature words written, the number of large words written in a 3-minute period were strongly correlated (ranging from .67 to .84) with other measures of written expression. In a replication study, Deno, Marston, and Mirkin (1982) found moderate to high correlations (ranging from .58 to .68) between these same measures. Furthermore, these indicators were successful at discriminating between students in general education and special education as well as differentiating student writing performance across grade levels (Deno et al., 1982; Deno et al., 1980).

In a longitudinal study, Marston, Lowry, Deno, and Mirkin (1981) investigated the use of the number of words written and the number of words spelled correctly as indicators of performance across Grades 1 to 6. The results revealed that the number of words written and the number of words spelled correctly increased with each succeeding year of school. Moreover, the results indicated that the with-in grade level performance of students significantly increased from fall to winter to spring. Thus, this study generated support for the use of these measures as valid indicators of student writing performance across grade levels, with-in grade levels, and over time.

*Correct word sequences at the elementary level.*

In addition to total words written and total words spelled correctly, Videen et al. (1982) examined the use of correct word sequences as an indicator of student writing proficiency at the elementary level. The results demonstrated a high correlation between the number of correct word sequences and the number of words written ( $r = .92$ ) as well as with the number of words spelled correctly ( $r = .92$ ). Akin to the number of words written and the number of words spelled correctly, results indicated an increase in the number of correct word sequences as grade levels increased. Tindal and Parker (1991) found similar results across Grades 2 to 5 for correct word word sequences, suggesting that the number of correct word sequences is a useful indicator of writing performance across the early grades.

*Other countable indices at the elementary level.*

A recent study by Gansle, Noell, VanDerHeyden, Naquin, and Slider (2002) examined the relations between various indicators of performance and scores on the language usage/expression and total writing subscales of the Iowa Tests of Basic Skills (ITBS) for third grade students. Results revealed that the number of correct punctuation marks and the number of

correct word sequences written in a 3-minute period were most strongly correlated (.36 to .44) with the writing subscale scores on the ITBS. Further, words in correct sequence and correct punctuation marks were positively correlated with teacher holistic scores. These findings suggest, along with correct word sequences, correct punctuation marks may be another useful indicator of writing proficiency at the elementary level.

#### *Countable Indices for Written Expression at the Secondary Level*

At the secondary level, studies suggest that the indices used to measure writing proficiency at the elementary level may not appropriate (Espin & Tindal, 1998). As indicated, the number of words written, the number of words spelled correctly, and the number of correct word sequences are valid indicators of writing performance at the elementary level. However, when applied to the secondary level, the same indices may not be valid (Parker et al., 1991; Watkinson & Lee, 1992).

#### *Elementary indicators applied to secondary students.*

Tindal and Parker (1989) examined the appropriateness of elementary indicators such as the number of words written, the number of words spelled correctly, and the number correct word sequences as indicators of writing performance at the secondary level. One hundred and seventy-two compensatory and special education students in Grades 6 to 8 participated in the study. Results revealed that the number of words written, the number of words spelled correctly, and the number of correct word sequences were not the most appropriate indicators of writing proficiency for older students. These indicators did not sufficiently correlate ( $r = .10$  to  $.45$ ) with holistic ratings of students writing samples, nor did they differentiate between compensatory and special education students. In addition, Tindal and Parker (1989) also examined product-independent measures such as: percentage of legible words, percent of words spelled correctly,

percent of correct word sequences, and the mean length of correct word sequences. A discussion of these analyses follow.

*Percentage of words spelled correctly and percentage of correct word sequences.*

It has been suggested that product-independent measures are the most valid indicators of a students writing proficiency at the middle school level (Tindal & Parker, 1989). Tindal and Parker (1989) found that product-independent measures such as the percentage of words spelled correctly and the percentage of correct word sequences correlated more highly with holistic ratings ( $r = .73$  and  $.75$ , respectively) than did product-dependent measures (the number of words written, the number of words written legibly, the number of words spelled correctly, and the number of correct word sequences). Results also revealed that these two percentage measures were able to differentiate between compensatory and special education students.

In a later study, Parker et al. (1991) investigated the effectiveness of product-independent measures ability to make special education screening decisions. Participants in the study included 243 students in Grades 6, 8, and 11. Results revealed that the percentage of correctly spelled words and the percentage of correct word sequences were the most appropriate indicators for screening and eligibility decisions. Thus, this study added to the support of product-independent measures as valid indicators of writing proficiency.

Watkinson and Lee (1992) examined the relations between CBM writing measures for compensatory and special education middle school students. Concurring with earlier findings on product-independent measures (Tindal & Parker, 1989), Watkinson and Lee (1992) found that percentage of words spelled correctly and the percentage of correct word sequences were able to differentiate compensatory and special education students at the 6<sup>th</sup> and 8<sup>th</sup> grade level. Nevertheless, while the percentage of words spelled correctly and the percentage of correct word

sequences appear to be valid indicators of writing proficiency at the middle school level, caution should be applied when using them to assess progress over time (Parker et al., 1991; Shinn, 1998; Tindal & Parker, 1989). In addition, when examining the ability of product-dependent measures to differentiate compensatory and special education students, Watkinson and Lee (1992) found that the number of correct and incorrect word sequences were the only product-dependent measures capable of differentiating these two groups.

*Correct word sequences at the secondary level.*

The Parker, Tindal and Hasbrock (1991) study not only bore support for the use of product-independent measures as indicators of writing proficiency, but also substantiated the use of correct word sequences for secondary students. Results from their early 1990s study revealed that the number of correct word sequences was a good predictor of writing proficiency for Grades 6, 8 and 11, with correlations ranging from .48 to .52. In addition, results indicated a strong correlation between the number of correct word sequences and holistic ratings ( $r = .48$  to  $.56$ ). However, unlike product-independent measures, Parker et al. concluded that the number of correct word sequences was not a suitable tool for making eligibility and screening decisions. The number of correct word sequences only differentiated student performance between grade levels when applied to students who performed above the 10<sup>th</sup> percentile. Conversely, the percentage of correct word sequences appeared to be a better measure for differentiating students below the 10 percentile.

*Combination measures at the secondary level.*

Espin, Scierka, Skare, and Halverson (1999) investigated the use of combination measures for written expression at the secondary level. Participants in the study were 147, randomly chosen 10<sup>th</sup> grade students from basic, regular, and enriched English classes. They also



included a group of learning disabled students. Criterion measures such as the Language Arts subtest from the California Achievement Test (CAT), English class grades, and holistic rating of writing samples were used in this study. The number of words written, the number of words spelled correctly, the number of characters per word, and the number of sentences written in response to 3-minute writing probe were examined via computer scoring. In addition, the number of correct word sequences and the mean length of correct word sequences were included as measures and scored by hand.

Researchers found a significant correlation, although moderate to low ( $r = .30$  to  $.45$ ), when comparing the number of correct word sequences, the mean length of correct word sequences, the characters per word and the sentences written to criterion measures. Accordingly, regression analysis revealed a moderately high correlation ( $r = .62$ ) between a combination of measures (the number of character per word, the number of sentences written, and the mean length of correct word sequences) and the Language Arts subtest of the CAT. In conclusion, while these results imply that combination measures, rather than one measure, may be better predictors of secondary students' writing proficiency; Espin et al. (1999) suggest that graphically displaying numerous measures may be difficult. Furthermore, these same combination measures also successfully differentiated between learning disabled students and students in basic, regular, and enriched English classes.

*Correct word sequence minus incorrect word sequences at the secondary level.*

In an attempt to expand the research on CMB in written expression and identify the best indicators of writing proficiency at the middle school level, Espin et al. (2000) examined the writing samples of 112 students in Grades 7 and 8. Teacher ratings of students' writing samples and a district writing test were the criterion measures used in this study. A number of

measurement indicators such as the number of words written, the number of words, the number of words spelled correctly, the number of words spelled incorrectly, the number of characters per word, the number of words per sentence, the number of correct words sequences, the number of incorrect word sequences, and the mean length of correct word sequences were examined. Results indicated correct word sequences minus incorrect word sequences (CWS-IWS), when compared to both teacher's ratings and district writing test, was the most reliable and valid predictor of student writing proficiency at the middle school level (correlations ranging from .65 to .75). Therefore, this study suggested that CWS-IWS is a useful indicator of written expression for older students.

Scierka, Weissenburger, and Espin (2003) did a combined study examining CBMs in written expression at the middle school level. Criterion measures such as students' scores on the Language Arts subtest of a statewide assessment and a measure of text coherence (i.e., the number of events on the causal chain of events; Trabasso & van den Broek, 1985) were used in this study. Measures used to score the writing samples were the total number of words, the number of correct word sequences, and the number of CWS-IWS. Results revealed that the number of correct word sequences and the number of CWS-IWS correlated moderately ( $r = .47 - .63$ ) with the standard scores on the Language Arts subtest of a statewide assessment. Thus, the Language Arts correlations suggested that the number of correct word sequences and CWS-IWS are good predictors of a student writing proficiency at the middle school level.

The Scierka et al. study (2003) also found that the total number of words, the number of correct word sequences, and CWS-IWS were highly correlated with the number of events on the casual chain. Moreover, the total number of words written was the highest predictor of the number of events in a casual chain with correlations of .70 to .79, respectively. Therefore, the

results for number of words written varied with the criterion measures used in the study.

Nevertheless, the combined study provided consistent support for the use of the number of correct word sequences and CWS-IWS as valid measures of writing proficiency for middle school students.

## Chapter 3

### *Conclusions and Discussion*

#### *Summary of Main Findings*

The basis of this literature review was to examine what is currently known about CBM in written expression, what constitutes CBM in written expression, and what is known about curriculum-based measurement for writing at the secondary level. Research at the elementary level has demonstrated that there are numerous reliable and valid indicators of writing performance for students at this level (Deno et al., 1980; Deno et al., 1982; Espin et al., 2000; Marston et al., 1981). However, studies indicate that indices used to measure writing proficiency at the elementary level may not be the most appropriate measures for students at the secondary level (Parker et al., 1991; Watkinson & Lee, 1992).

At the elementary level, an extensive amount of research has been done to determine the most reliable and valid indicators of a child's general writing proficiency using CBM in written expression. Research suggests that the total number of words written correctly, the number of words spelled correctly, and the number of correct word sequences are good predictors of a child's writing skills (Deno, et al., 1980; Deno, et al., 1982; Videen, et al., 1982). These measures have been found to correlate moderately or strongly with other standardized measures of writing and holistic ratings of writing. Moreover, these measures have proven to be valid indicators of student writing performance across grade levels, with-in grade levels, and over time. They also have been useful in differentiating between students in general and special education (Deno, et al., 1980; Deno, et al., 1982; Marston et al., 1981; Tindal & Parker, 1991; Videen, et al., 1982). However, preliminary CBM research suggests that additional indices of writing proficiency may exist. For instance, Gansle, Noell, VanDerHeyden, Naquin, and Slider (2002) found that the

number of correct punctuation marks was positively correlated with teacher holistic scores and previously validated tests of written expression. Thus, correct punctuation marks also may be useful indicators of a child's writing proficiency at the elementary level.

At the secondary level, research revealed that indices used to measure writing proficiency at the elementary level were not valid for students at the secondary level (Tindal & Parker, 1989; Watkinson & Lee, 1992). Tindal and Parker (1989) found that the that the number of words written, the number of words spelled correctly, and the number of correct word sequences were not the most appropriate indicators of writing proficiency for older students. These secondary level indices did not correlate well with holistic ratings, nor were they able to successfully differentiate between students in general and special education (Tindal & Parker, 1989). Nevertheless, later findings pertaining to the validity of correct word sequences and indices of writing proficiency at the secondary level are not as clear (Watkinson & Lee, 1992).

Parker et al. (1991) found that the number of correct word sequences was a good predictor of writing proficiency for Grades 6, 8, and 11, with strong correlations between holistic ratings and the number of correct word sequences ( $r = .48$  to  $.56$  respectively). However, similar to an earlier finding (Tindal & Parker, 1989), Parker et al. (1991) concluded that the number of correct word sequences was not suitable for making eligibility and screening decisions. Yet, later research by Watkinson and Lee (1992) suggested that the number of correct as well as incorrect word sequences were able to differentiate between general and special education students. Therefore, while the number of words written and the number of words spelled correctly are not sensitive enough to make screening and eligibility decisions at the secondary level, the jury is still out on the effectiveness of the number correct word sequences as a screening and eligibility tool. Nonetheless, research indicates that production-independent measures such as percentage

measures were better able to differentiate between students in general and special education than production-dependent measures (i.e., fluency measures).

Previous research revealed that percentage measures (i.e., the percentage of words spelled correctly and the percentage of correct word sequences) correlated most highly with other criterion measures than did production-dependent measures (Parker & Tindal, 1989; Parker et al., 1991; Watkinson & Lee, 1992). Thus, some research suggests that percentage measures are the most valid indicators of writing proficiency at the middle school level. However, while research supports the use of product-independent measures such as the percentage of words spelled correctly and the percentage of correct word sequences for screening and eligibility decisions, caution should be applied before using them to monitor student's progress because they may not be sufficient at detecting academic growth, a primary purpose of curriculum-based measurement (Espin et al, 2000; Shinn, 1998).

Knowing this, Espin et al. (1999) did not use percentage measures in a late 1990's study. The results of this study found that combination measures, however difficult to graph, may be better indicators of student writing growth at the secondary level. In later research, Espin et al. (2000) also found that the number of correct sequences minus incorrect word sequences was a valid indicator of writing proficiency for older students. Accordingly, Scierka et al. (2003) found that both the number of correct word sequences and CWS-IWS were effective measures of writing proficiency for the middle school students. Unfortunately, less research has been done pertaining to the effectiveness of CBM in written expression for high school students. Therefore, the most reliable and valid indicators of writing proficiency at the secondary level are still debatable.

### *Limitations*

While the goal of this literature review was to remain neutral and objectively report research results, human error and biases must be taken into account. For instance, the researcher's interpretation of the studies examined may bias the conclusions drawn in this literature review. In addition, the researcher's own biases toward CBM and their uses in schools may skew the way the findings are presented.

Another limitation to this literature review is that most of the studies relied on holistic scores as the criterion measures for determining the effectiveness of CBM indicators in written expression. Holistic scores are derived from a reader's opinion; thus, they are subjective measures of performance. This, as a result, may jeopardize the generalizations of the findings related to writing proficiency.

Further, little research has been conducted pertaining to CBM and secondary students. Moreover, even less research has been done investigating the most appropriate indicators of written expression at the high school level.

### *Implications for Further Research*

Results from this literature review point to a need for further research. Currently, there is limited information on CBM in written expression. There is even less information on their use across grade levels and at the secondary level. Thus, more research needs to be done before educators can confidently utilize CBM in written expression at the secondary level.

In addition, previous research indicates that the indices used to measure writing proficiency at the elementary level may not be the most appropriate measures for students at the secondary level. For instance, the number of words an elementary child writes can be used to measure their writing proficiency at the elementary level. After this child reaches middle or high

school, however, this indicator of writing performance is no longer valid. Therefore, there is currently a need for a writing measure that can accurately assess a student's writing ability throughout a student's educational career, while at the same time maintaining the characteristics of CBM (i.e., short-duration, multiple forms, and easy to score).

CBMs are often used as a way to monitor academic progress annually, bi-annually or weekly. In doing so, CBMs in written expression must remain sensitive to change. Thus, it is important for future research to identify indicators that are sensitive to changes in writing performance across grade levels and for older students. Furthermore, as the Parker et al. (1991) research suggested there is a need for indicator of performance for individuals working below to 10<sup>th</sup> percentile.

#### *Implications for Practice*

By using these simple measures, teachers can assess the effects of their current writing curriculum while monitoring an individual student's writing progress and capabilities. At the elementary level, teachers can be confident that CBM measures such as the number of words written, the number of words spelled correctly, and the number of correct word sequences can accurately assess student writing performance and progress. At the secondary level, teachers should use caution before using CBM in written expression to measure a student's writing performance, particularly for high school students. Nevertheless, CBMs in written expression may be used as a supplemental measure of a student's writing performance for secondary level students.

#### *Conclusion*

The use of curriculum-based measurement (CBM) in written expression is becoming more common in today's schools; however, there is a need for more information pertaining to the



technical adequacy of these measures at the secondary level. As a result, this research project examined the current literature related to CBM in written expression. The results of the literature review suggest that indicators of writing performance at the elementary level are not the most appropriate indicators of writing performance at the secondary level, and emerging evidence indicates the need for more complex measures for middle and high school students.

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