ELL SERVICE MINUTES AND MAP TEST ACHIEVEMENT:

A CORRELATION STUDY

By

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ABSTRACT

School districts across the United States attempt to meet the needs of ELL (English Language Learner) students in a variety of ways. A medium-sized suburban school district in the Kansas City metropolitan area encounters a varying ELL population each year and continues to service the needs of elementary ELL students with a “pull out” model. With only one traveling elementary ELL teacher employed by the district, ELL service time with a qualified ELL teacher is minimal for most elementary ELL students. The study involves three research questions. (1) Do the average weekly ELL service minutes for Elementary students in the school district meet the recommended number of service minutes from the Missouri Department of Elementary and Secondary Education (DESE)? (2) Is there a relationship between ELL service minutes and achievement on the Missouri Assessment Program (MAP) test for third and fourth grade ELL students? (3) Would an additional elementary ELL teacher increase MAP test scores? The analysis of this particular district’s service minutes as compared to those recommended by Missouri’s Department of Elementary and Secondary Education show this school district grossly underserves its ELL students. A study of this school district’s third and fourth grade ELL students’ service minutes and their MAP (Missouri Assessment Program) test scores from 2012-2013 were analyzed, and the results show a negative correlation in Communication Arts, and a positive correlation in Math, although though both correlations were extremely weak due to the small sample size. Due to lack of significance in the data analyzed, a conclusion as to whether or not an additional elementary ELL teacher would increase ELL student test scores is not clear; however, when considering state recommended student to teacher ratios and minimum service minutes, the conclusion can be drawn that the district should examine its allocation of resources to the ELL program.
INTRODUCTION TO THE STUDY

Background

The school district under examination in this study is a medium-sized district in the Kansas City, Missouri metropolitan area with an enrollment of approximately 4,800 students. The district has a very unique composition of rural and suburban micro-communities. Currently, the district maintains a population of about 80 ELL students, 30-40 of those being elementary students. (The district considers elementary students to be Kindergarten through fourth grade, based on building composition.) It saw growth in the ELL population for the 2007-2008 school year and 2010-2011. Both years, the number of students served and monitored increased by 19 students; however, it is rare that an elementary ELL student in the district achieves beyond the score of “Basic” on the MAP (Missouri Assessment Program) test. Taking the MAP test is a requirement for all third through eighth grade students in Missouri, with the exception of students who have been in the United States less than one year.

The basic performance of third and fourth grade ELL students within the district in question is evidence that the achievement gap between native English speaking elementary students and ELL elementary student in this district is not closing. In 2012, the district Communication Arts (CA) scale scores for third and fourth grades fell slightly below the state averages for ELL students, but they were significantly below the state mean scale score for total population of third and fourth grade students (Missouri Comprehensive Data System, 2013). When compared to a district of similar student population and socio-economic status in the area, the scores of ELL students in the district studied were significantly less than those in the similar district (Missouri Comprehensive Data System, 2013). In Texas, a comparison study of Hispanic and white student test scores from 1992 to 2009 showed that while reading scores increased
significantly for both groups, the achievement gap between Hispanic and white student scores did not change (Hemphill & Vanneman, 2011). Closing the achievement gap for ELL students is a continued problem for many districts across the United States, including the district in question within this study. “For the nation as a whole, NAEP (National Assessment of Educational Progress) reveals that ELL students were far behind white students in their mathematics and reading skills in 2005” (Fry, 2007, p. 4).

ELL students are a growing population in U.S., Missouri, and the school district in question. “National Enrollment of ELL students in public schools grew 57 percent between 1995 and 2009 (Flannery, 2009, p. iii). The requirements of No Child Left Behind (NCLB) required school district to report test scores of ELL students as part of a subgroup. As a result, school districts that do not show AYP (Adequate Yearly Progress) in the ELL subgroup can be under intense scrutiny. In 2010, the independent body that sets policy for the National Assessment of Educational Progress (NAEP), approved a policy that significantly narrowed the grounds for excluding students who are English-language learners from the NAEP exams (Sawchuk, 2010).

With the approval of Missouri’s NCLB waiver (which restructured how schools should prove Adequate Yearly Progress- AYP), and the changes to Missouri’s School Improvement Program (now called MSIP 5), ELL students are now part of a super subgroup to be examined closely. In its Missouri’s No Child Left Behind (NCLB) Flexibility Waiver Approval: Accountability Frequently Asked Questions, Missouri DESE explained, “Use of a Super Subgroup allows for inclusion of students otherwise missed due to a low number of students in a single subgroup, eliminates a duplicated count of an individual student who may fall into numerous subgroups, and holds all districts accountable for the same number of subgroups”
The progress of ELL students will be even more important for attaining the points needed for accreditation with MSIP 5.

The ELL students of the school district in question who attend elementary schools receive minimal ELL services. The major concern is that elementary ELL students’ English proficiency is not improving enough for those students to score commensurate with their native English-speaking peers, which, in turn, affects the district’s ability to meet achieve all of the points needed to be fully accredited through MSIP 5.

**Conceptual underpinning**

Elementary ELL students are underserviced in the district. Even with increasing pressure to produce higher test scores, it continues to employ only one ELL teacher to provide English instruction for thirty or more students. Missouri’s state budget shortfalls of the last few years have not improved the chances of the district increasing its ELL staff. The impact on ELL student achievement is evident at the Elementary level.

There was one (traveling) elementary ELL teacher in the district in 2011-2012 and 2012-2013. Many students were only seen once or twice per week for 30 minutes. This “hit-and-miss” form of English instruction is inconsistent and so brief that there is little crossover to regular classroom activities. Most of the elementary schools do not have a permanent space in which the ELL teacher can serve students, so the teacher provides instruction in a common area, such as the library, or even within a regular classroom.

**Purpose of Study**

The purpose of this study was to gauge the relationship between the number of minutes of ELL instruction provided to third and fourth grade ELL students in the district and achievement on the Missouri Assessment Program (MAP) test in 2012-2013. For this case the
independent variable is minutes ELL students receive services, and the dependent variable is MAP scores.

Research Questions

The research questions to be considered are as follows:

- RQ₁ Do the average weekly ELL service minutes for Elementary students in the school district meet the recommended number of service minutes from the Missouri Department of Elementary and Secondary Education (DESE)?
- RQ₂ Is the number of ELL service minutes associated with achievement on the MAP test for third and fourth grade ELL students?
- RQ₃ Would an additional elementary ELL teacher increase the number of instructional minutes for ELL students, therefore increasing MAP test scores?

Null Hypotheses

Using the above research questions, three null hypotheses were generated. (1) The weekly service minutes provided to third and fourth grade ELL students in the district in question do not meet the recommended number of service minutes from Missouri DESE. (2) There is no relationship between the number of ELL service minutes and achievement on the MAP test for third and fourth-grade ELL students. (3) An additional elementary ELL teacher in the district to increase the amount of service minutes for ELL students would not increase MAP scores.

Anticipated benefits of the study

The results of this study will inform the instructors and administrators in the district studied of the effectiveness of the current ELL services provided to students in third and fourth grades. The comparison of service minutes to MAP assessment scores provide valuable
information to the district about the effectiveness of the elementary ELL services provided to students.

Definition of terms

**CA:** The acronym CA is commonly used in place of Communication Arts within the school district of study.

**ELL:** The acronym ELL is used to describe an English Language Learner- A term pertaining to a group of students needing English education due to limited English proficiency (Missouri Department of Elementary and Secondary Education, 2011).

**DESE:** The acronym DESE refers to the Department of Elementary and Secondary Education in Missouri.

**MAP:** The acronym MAP refers to the Missouri Assessment Program- the statewide student assessment program developed in response to adoption of the Outstanding Schools Act in 1993 (Missouri Department of Elementary and Secondary Education, 2011).

**MSIP 5:** This acronym refers to the fifth cycle, or version, of the Missouri School Improvement Program, the program through which Missouri accredits its school districts and encourages school improvement (Missouri Department of Elementary and Secondary Education, 2011).

**NAEP:** This is a commonly used acronym for the National Assessment of Educational Progress. NAEP is a nationally representative assessment of what America’s students know and can do in various subject areas. It is commonly known as the nation’s report card (Missouri Department of Elementary and Secondary Education, 2011).

**NCLB:** The federal No Child Left Behind Act of 2001 requires all schools, districts, and
states to show student are making Adequate Yearly Progress (Missouri Department of Elementary and Secondary Education, 2011).

**TESOL:** This international association of Teachers of English to Speakers of Other Languages, also referred to as TESOL. TESOL International Association’s mission is to advance professional expertise in English language teaching and learning for speakers of other languages worldwide (TESOL, 2012).

**REVIEW OF LITERATURE**

A variety of studies continue to show an achievement gap between the performance of native English speaking students and ELL students; however, there is no one prescribed method for closing that gap. What educators do have are recommended minimum service minutes, suggested ELL lesson plans, and ELL student to teacher ratios. There is also evidence that intense instruction, which allows a student to exit an ELL program as quickly as possible, is more successful than a spattering of surface-level instruction.

On state assessments, the percentage of students who achieve proficiency (as defined by each state) is 20-30 percentage points lower among ELL students than among non-ELL students (Abedi & Dietel, 2004). It is a well-known reality that, on average, ELL students do not perform at the same level of proficiency as their peers who are native English speakers.

Missouri’s Department of Elementary and Secondary Education (DESE) has recommended instructional times for grade level spans and levels of proficiency of ELL students at each span. The minimum amount of time recommended by DESE for any grade span, even at the highest level of proficiency, is 45 minutes per week. The highest recommended time for an elementary student is 600 minutes per week (Lanier, 2011). The district in question did not come
close to those recommendations for nearly any student in its recent past, particularly in 2011-2012.

Multiple reviews of a skill or concept are necessary in a mainstream elementary classroom, and the same applies to ELL instruction. For ELL instruction to be effective, and for ELL students to make application to their regular classroom work, the instruction time cannot be limited to 30 minutes per week. Thirty minutes per week would only allow an ELL teacher time to provide instruction on one or two skills at a very shallow level.

There are may ELL lesson plan models. Of those examined from TESOL resources, most included time for motivation (connecting background knowledge), development (instructional input and guided practice), application (independent practice), and summary (closure) (Gutterman, 2009). Even a textbook for pre-service ELL teachers instructs teachers to complete an “information and motivation phase,” as well as the other traditional Madeline Hunter phases of input, guided practice, and independent practice (Celce-Murcia, 2001). If an ELL teacher follows best practice and completes all phases of a lesson in the 30 minutes, very little new instruction actually takes place. Compound this with the fact that the 30 minutes is the only time a student is seen by an ELL teacher each week and there is opportunity for deeper level learning.

“More lengthy and robust instruction that involves explicit teaching that includes both contextual and definitional information, multiple exposures to target words in varied contexts, and experiences that promote deep processing of words meanings is likely to be more powerful than less time-consuming and less robust instruction” (Graves, August, & Mancilla-Martinez, 2012, p. 23). ELL students who receive only 30 minutes per week are not able to experience deep level instruction. Thirty minutes, even 60 minutes, allows for surface-level instruction and quick activities that can be completed within the time constraint.
While keeping ELL students in their least restrictive environment is as important for those students as it is for special education students, it seems a shorter amount of intense instruction is better than sporadic instruction over a course of many years. In a study of ELL students in Texas, the researchers found that ever-ELL students (those who had been identified as ELLs from their entrance into the district) who completed and exited a language acquisition program after three years achieved the best test score results; however, those who had been in ELL programs for five or more years, or long-term ELLs, lagged were farther behind in every grade (Flores, Batalova, & Fix, 2012).

**RESEARCH METHODS**

*Research design*

The study included use of descriptive statistics and non-experimental research design. Non-experimental research design was used to explore research question two because the group studied was not selected at random, nor were multiple groups analyzed (Trochim, 2006). Only a single group of ELL students’ MAP test scores were analyzed from the 2012-2013 school year.

RQ₁ was researched using information provided on the Missouri DESE website and provided in the 2011-2012 District English Language Learners (ELL), Migrant and Title III-LEP K-12 Program Evaluation. RQ₂ was studied through the use of statistical analysis of ELL given service minutes compared to MAP test achievement. The statistical calculations were made using the online statistical analysis program VasserStats. RQ₃ was answered after review of the data provided by the statistical analysis and the review of recommendations provided by the TESOL international association and the Missouri DESE.
Data collection methods and instruments used

The elementary ELL teacher at the district in question provided a number of students who received ELL services in the 2011-2012 and 2012-2013 school years, as well as the number of minutes of English instruction received during those years. A total of 19 third and fourth graders received ELL services at some point in 2011-2012 and nine during 2012-2013. The Assistant Superintendent of Educational Services provided MAP scores from 2011 to 2013. Several students did not take the MAP test in 2011-2012 due to the Missouri DESE provision that students who have been in the country less than one year are exempt from MAP testing.

Statistical analysis methods used

Mean number of service minutes and mean MAP test scores were attained using Microsoft Excel, while the correlation coefficient, degree of practicality, and p value were analyzed using the VasserStats website for statistical computation.

FINDINGS

Research Question One

Third grade ELL students received a given time of 30-60 minutes English instruction per week during 2011-2012, depending on their proficiency levels, even though the recommended time from the Missouri DESE was 45 to 150 minutes per week (Table 1). Fourth grade ELL students received 30-120 minutes of given time, depending on proficiency levels, although the state’s recommendation was 300-600 minutes per week (Table 1).
<table>
<thead>
<tr>
<th>Elementary 2-3 by English proficiency level:</th>
<th>Recommended Time</th>
<th>FOSD Given Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entering/Beginning Students:</td>
<td>300 min/week</td>
<td>60 min/week</td>
</tr>
<tr>
<td>Developing:</td>
<td>150 min/week</td>
<td>30 min/week</td>
</tr>
<tr>
<td>Expanding/Bridging:</td>
<td>90 min/week</td>
<td>30 min/week</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Middle School 4-8 by English proficiency level: (4th Grade)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Entering/Beginning Students:</td>
<td>600 min/week</td>
</tr>
<tr>
<td>Developing:</td>
<td>420 min/week</td>
</tr>
<tr>
<td>Expanding/Bridging:</td>
<td>300 min/week</td>
</tr>
</tbody>
</table>

In 2012-2013, third and fourth grade students’ actual service minutes ranged from 45 to 190 minutes per week, which is only slightly closer to the recommended number of minutes from Missouri DESE. While the ELL population changed somewhat (the number of Kindergarten to second grade students increased, and the number of third and fourth decreased), the number of minutes of instruction provided still did not meet the recommended numbers from Missouri DESE in 2012-2013.

**Research Question Two**

According to the mean MAP scale scores, ELL students who received a greater number of weekly service minutes from an ELL teacher had higher MAP test scale scores in both Communication Arts and Math. A greater difference was seen in Math scores (Table 2).

<table>
<thead>
<tr>
<th>2012-2013 Mean MAP Scale Score by ELL Minutes Per Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELL Minutes &gt; 100</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

| ELL Minutes < 100                                     | 2      | 628.5                   | 614                        |

Students who received fewer than 100 minutes per week scored an average of 23.29 points lower on the MAP Math test than students who received more than 100 minutes per week of ELL instruction. On the Communication Arts test, students who received fewer than 100 ELL
service minutes per week achieved an average of 4.64 fewer points less than those students who had more than 100 minutes of instruction.

When the CA MAP scale scores and number ELL service minutes were analyzed using a linear correlation test in VasserStats, the correlation between the two variables was negative. The result was $r = -0.0928$. Because the $r$ value was so small, the negative correlation between ELL service minutes and CA MAP test scores is found to be a weak correlation (Figure 1).

![CA MAP And ELL Service Minutes](image)

Figure 1. 2012-2013 Communication Arts MAP test scores and ELL minutes served within the district.

Because the degree of practicality ($r^2$) was 0.0086 (.86%), the analysis does not have the practicality needed to rule out the chance for error. A larger sample size would be needed to achieve a higher $r^2$ value. Because of the small sample size of $n = 9$, the alpha, or level of significance was set at .25. Trichom states that most social science research is completed using an alpha of .05 (Trichom, 2006). However, this study is of such size that there is little risk of making a Type I Error. The $p$ value was found to be 0.4048, which was greater than alpha = or < .25 (see Table 2); therefore, the null hypothesis cannot be rejected. The number of service
minutes received by third and fourth grade students at Fort Osage does not significantly associate with the students’ CA MAP scale scores.

Table 3

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>df</th>
<th>p</th>
<th>r</th>
<th>r²</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA MAP Scale Score</td>
<td>9</td>
<td>632.11</td>
<td>12.72</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ELL Service Minutes</td>
<td>9</td>
<td>333.33</td>
<td>184.59</td>
<td>7</td>
<td>0.4048</td>
<td>-0.0928</td>
<td>0.0086</td>
</tr>
</tbody>
</table>

With regard to Math MAP scores, a different result occurred. Although weak, the correlation between Math MAP scale scores of ELL students and ELL services minutes was positive. This positive correlation displays that there is an association between higher numbers of ELL services minutes and higher Math MAP test scores of ELL students in third and fourth grade.

![Math MAP and ELL Service Minutes](image)

Figure 2. 2012-2013 Math MAP test scores and ELL minutes served in the district.

The correlation coefficient was $r = 0.0289$, which showed a very slight positive correlation (see Figure 2). It is also important to note that the degree of practicality was 0.0008,
which shows there was much room for error (most likely due to the small sample size). Again, the level of significance was set at alpha = or < .25, due to the small sample size used in the statistical analysis. The p value was 0.4692; consequently the null hypothesis was not rejected (Table 4). The number of ELL service minutes is not significantly associated with the level of achievement of third and fourth grade ELL students on the MAP test.

Table 4
Summary of Correlation Analysis

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>df</th>
<th>p</th>
<th>r</th>
<th>r^2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math MAP Scale Score</td>
<td>9</td>
<td>632.11</td>
<td>25.9636</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ELL Service Minutes</td>
<td>9</td>
<td>333.33</td>
<td>184.5941</td>
<td>7</td>
<td>0.469238</td>
<td>0.0289</td>
<td>0.0008</td>
</tr>
</tbody>
</table>

sign = or < .25

Research Question Three

The ELL students of the district in achieved mean scale scores in CA less than the state average and less than a similar district in the same geographical area in 2012 (Missouri Comprehensive Data System, 2013). For ELL students in the district, the difference was about three points less when compared to state scale scores in CA, but when scale scores are compared to a similar district, there is a greater disparity (see Table 5). While there is an obvious difference in CA scale scores, but the difference in Math scale scores is not as significant. ELL students in the district perform at or above the mean scale score in Math and at or above the mean scale score of a similar district.
<table>
<thead>
<tr>
<th>Table 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missouri Assessment Program (MAP Test) Mean Scale Scores</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>State Average, ELL Students</td>
</tr>
<tr>
<td>-----------------------------</td>
</tr>
<tr>
<td>Third Grade CA</td>
</tr>
<tr>
<td>Third Grade Math</td>
</tr>
<tr>
<td>Fourth Grade CA</td>
</tr>
<tr>
<td>Fourth Grade Math</td>
</tr>
<tr>
<td>Source: Missouri Comprehensive Data System, 2013</td>
</tr>
</tbody>
</table>

Based on the statistical analysis of the third and fourth grade ELL students’ scores in district in question, and the review of ELL studies related to the topic, one could conclude that the district could hire a second elementary ELL teacher, but the correlation between increased ELL service minutes and MAP test achievement may be weak. Adding a second ELL teacher would increase the number of instructional minutes ELL students would receive from a certificated ELL/ESOL teacher. According to the data included above, this would result in higher MAP test scores for ELL students, but the scale scores may not increase significantly in CA. The district might not perceive that the investment in another staff member’s salary and benefits would be worth a small amount of growth in ELL students’ MAP test scores.

Since the whole purpose of an ELL program is to bridge the gap in achievement between ELL students and native English speakers, it seems to make logical sense that a district should do whatever possible to provide ELL students with as much ELL instruction time as possible; as summarized in the Review of Literature, increased service minutes would allow time not only for a broader range of instruction but also for deeper level instruction. However, if decisions were to
be made based on the statistical analysis rendered in this study, the product of increased instruction time may not be significantly increased test scores.

RECOMMENDATIONS

ELL instruction in the district could be examined from an RTI perspective. In a study of the RTI model as it could potentially apply to ELL students, researchers found that there were three options for students who did not attain desired cut-off scores. One, the current interventions could be continued without modification. Two, these students could receive a different intervention than the one they had been receiving. Three, students who do not meet the goals set within a desired time frame could receive more intensive interventions (Healy, Vanderwood, & Edelston, 2005). If the test scores of ELL students in the district show they are not meeting desired MAP scores, and the RTI model was applied, there would need to be some changes made within the ELL department. The interventions should be modified, or more intensive interventions are needed, to close the gap between ELL student scores and the scores of native English speakers. If more intensive modifications are found to be needed, particularly to close the achievement gap with regard to test scores, one could conclude that the district should consider hiring an additional elementary ELL teacher.

The district already fails to meet the minimum and desirable standard of ELL-endorsed teachers set by the Missouri DESE, which requires a ratio of 25 students per teacher for grades K-2 and 27 per teacher for grades 3-4 (Missouri Department of Elementary and Secondary Education, 2012). In the ELL Program Evaluation prepared in 2011, the district in question listed teacher scheduling and transportation as barriers to meeting the state recommended ELL service time (Lanier, 2011). Since 2011, the district has added a half-time ELL teacher at the middle
school level. It is highly recommended that the district consider adding at least a half-time teacher at the elementary level as well.

CONCLUSIONS

Based on the data examined for RQ1, this study found that for ELL students 300 minutes (entering/beginning students), 150 minutes (developing students), and 90 minutes (expanding/building students) are suggested by Missouri DESE, but only 90 minutes (entering/beginning students) or 30 minutes (developing/expanding/building students) are provided the district in question (Lanier, 2011). One traveling teacher among five buildings just does not allow for intense instruction for students who need more than just a quick grammar review. The district should be taking a closer look at the recommended number of minutes provided by Missouri DESE and the test scores of ELL students. Even a descriptive analysis shows ELL students are not performing nearly as high as the native English speaking students in district on state tests.

Regarding RQ2, the service minutes provided by the district are not significantly associated with MAP achievement for ELL students. However small, the correlation between CA MAP test scores and service minutes was negative, while the Math MAP test scores and ELL services minutes was positive. The conclusion can be made that, in the district in question, ELL service minutes are not associated with MAP test scores.

RQ3 is not clearly answered by the data analysis in this study. If the association between MAP test scores and ELL services minutes had been strongly positive, the justification for employing an additional ELL teacher would be simple; however, the association between the two variables was very weak, likely due to small sample size. It is unclear from the statistical data in
the study whether or not the district in question should invest in additional elementary ELL teachers. However, when the descriptive analysis of mean MAP scale scores of the district, the recommendations made by the state of Missouri, and the Program Evaluation prepared by the district’s own director of student support services are reviewed, it is obvious the district should allocate resources to hire an additional elementary ELL teacher.
References


