CAN MAP SCORES BE PREDICTED FROM STUDY ISLAND BENCHMARK SCORES?

By

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Abstract

High stakes testing has become the nation’s focus on the accountability for school districts and educators. Using predictive data to forecast results can provide information prior to high stakes testing to allow for differentiated or additional instruction to students who do not meet the expected proficiency requirement. In this paper a linear regression analysis was conducted to predict the outcome of the Missouri Assessment Program for the same sixth (2009-2010), seventh (2010-2011) and eighth (2011-2012) grade students. Study Island, a web-based instructional program, scores were analyzed to forecast student results. The results indicated that the communication arts Study Island benchmark scores were a predictor of a proficient score, proficient is a score in the range of 676-703. on the Missouri Assessment Program when the student scored 21 or higher on the Study Island benchmark. The MAP ranges the scores for communication arts from below basic (505-630), basic (631-675). Proficient (676-703) and advanced (704-855). The results indicated that the mathematics Study Island benchmark scores were a predictor of a proficient score, proficient is a score in the range of 685-723. on the Missouri Assessment Program when the student scored 21 or higher on the Study Island benchmark. The MAP ranges the scores for mathematics from below basic (510-639), basic (640-684). Proficient (685-723) and advanced (724-860).
Introduction

Background, Issues and Concerns

The school district studied is a small rural school located in north central Missouri. The school district studied has concerns about student performance on standardized state tests, specifically on the Missouri Assessment Program (MAP) Communication Arts and Math assessments in regards to the new requirements of Missouri School Improvement Program 5 (MSIP 5). In order to continue to meet Adequate Yearly Progress (AYP) goals, students in the lower performing areas need to make significant improvement. Being able to predict MAP assessment results from Study Island Benchmark assessment scores will provide the school district studied another tool to increase student achievement. As a response to intervention student progress is monitored and students lacking in basic skills are targeted with specific differentiated learning opportunities. As with the data collected for response to intervention the information garnered from the predictions of MAP scores will provide an opportunity for those students lacking or demonstrating a weakness in communication arts or math can be provided intervention services. This additional differentiated instruction should then lead to better performance on the state assessment or MAP.

Practice under Investigation

The practice under investigation is to study the predictability of MAP Assessment scores from Study Island Benchmark assessment scores.

School Policy to be Informed by Study
With the introduction of MSIP 5 every school district in the state of Missouri must meet the AYP standards on the Missouri Assessment Program (MAP) tests, if MAP assessment results can be predicted by Study Island Benchmark assessment scores the school district studied can better prepare for future assessment results.

*Conceptual Underpinning*

All schools have concerns for student performance on state achievement tests. By being able to predict MAP assessment scores from Study Island Benchmark assessment scores students can be better prepared to perform up to their potential when taking the state assessments. Theoretically, if the Study Island Benchmark assessment can predict student success on the MAP, Study Island evaluation will increase student achievement on the state assessment determining AYP.

*Statement of the Problem*

If Study Island Benchmark assessment scores can predict MAP assessment scores targeted intervention strategies can be implemented to increase the likelihood of student achievement on the state assessment or MAP test.

*Purpose of the Study*

To study the predictability of MAP assessment scores from Study Island Benchmark assessment scores.

*Research Question*
Can Study Island Benchmark assessment scores predict MAP assessment scores?

Null Hypothesis

Study Island Benchmark assessment scores cannot predict MAP assessment scores.

Anticipated Benefits of the Study

If Study Island Benchmark assessment scores can predict MAP assessment scores targeted intervention strategies can be implemented to increase the likelihood of student achievement on the state assessment.

Definition of Terms

MAP – Missouri Assessment Program- test given in the state of Missouri at the end of grades 3-8. Scale scores for communication arts were ranged: Advanced 704-855; Proficient 676-703; Basic 631-675; Below Basic 505-630. Scale scores for mathematics were ranged: Advanced 721-845; Proficient 681-720; Basic 628-680; Below Basic 495-627.

MSIP 5 – MSIP 5 performance standards were approved by the State Board of Education in December of 2011, and these standards go into effect December 2013. These performance standards are the standards and indicators that will affect the next round of accreditation classification decisions for school districts.

AYP- Annual Yearly Progress- sets certain goals for school districts to achieve to show student performance.

DESE- Department of Elementary and Secondary Education
Study Island – subscription web-based program used for instruction and review of state standards in Communication Arts, Math and Science.

Study Island Benchmark – Four benchmarks are taken throughout the school year to monitor individual and classroom progress on state standards and classroom instruction. Scale scores for communication arts and mathematics were ranged: Advanced 26-30; Proficient 21-25; Basic 16-20; Below Basic 1-15

Summary

A simple linear regression analysis was conducted to see if there was a relationship between Study Island Benchmark Scores and MAP Assessment scores. If a relationship is established intervention instructional strategies can be implemented with students prior to taking the current grade level MAP assessment.
Review of Literature

One of the most discussed and analyzed issues in public education have been the introduction of high-stakes testing for students and the outcomes of those assessments. Schools and educators find their futures tied to the demonstrated abilities of their students on annual assessments that are designed to show student proficiency of learned material. Predicting future outcomes of these high-stakes assessments can provide an opportunity for schools and educators to differentiate or re-introduce material that students might not have gained in their first offering. One study that considered this issue and looked at ways to predict future outcomes was conducted by Martindale, Pearson, Curda, & Pilcher (2005). The study used information garnered in the FCAT Explorer and their impact on the Florida Comprehensive Assessment Test. The FCAT Explorer is a computer based software program that is used to enhance student learning, these programs were developed as one of the reactions to high-stakes testing. When used appropriately, computers, educational software and Web resources can contribute in a variety of ways to effective learning environments (Martindale, Pearson, Curda and Pilcher 2005). Students can show higher achievement on standardized testing if computer and web-based tools are used effectively. Using scores from the computer and web-based programs to predict the standardized test outcomes can provide the opportunity for differentiated learning to be implemented prior to the actual assessment being performed.

Wiley and Deno (2005) sought information to predict successful outcomes by looking at English Learners and their results on oral reading and maze
measures. These tools had been used previously to determine at students risk for failure in grade level curriculum. “Research has found that the general procedures of curriculum-based measurement (CBM) are valid indicators of student performance even if the reading passages are not selected directly from the students’ curriculum” (Wiley, 2005 p. 207).

Some educators are not as confident that the CBM measures student proficiency and use the Maze tool as additional support for student comprehension. Atkins & Cummings (2001) and Stage & Jacobsen (2001), have all considered the predictive value of oral reading fluency on high-stakes testing. While many researchers have looked at the prediction of the future results for state assessments only a few have also considered the next step of the predictive data and that is to use the information to provide immediate intervention to those students who have been selected as possibly being unsuccessful on high-stakes assessment tools (Miller, 2009; Harding, Harrison-Jones, Rebach, 2012; Martindale, 2005).

Predicting future outcomes from informal assessments is not a new idea in education. Early screening of students for reading has been advocated for years with positive and negative results (Wood, Hill, Meyer and Flowers, 2005). Discussion from the beginning of the adoption of No Child Left Behind Act of 2001 as to the amount of financial support and the scientific validity of the processes to assess student abilities has not diminished the importance of early intervention for students.
Borman and Kimball (2005) discuss whether teacher’s who meet or exceed supervisor evaluation ratings produce students who meet or exceed on achievement results. Four hundred teachers and seven thousand students were used in the study. Implications related to teacher evaluations, teacher quality and educational inequality were evaluated. Teachers were evaluated based on their planning and preparation skills and instruction skills. Scores for teachers ranged from unsatisfactory (0), target for growth (1), proficient (2) and area of strength (3). Students were a mix of fourth, fifth and sixth grade and teacher/student ratio was averaged. Student demographics were similar for each grade. The study findings were mixed in relating the quality of the teacher to the classroom achievement gaps. Perceptions of the quality of the teacher were related to the perceived quality of the students begin taught in the classroom. Borman and Kimball (2005) did concluded that teacher preparatory programs should develop programs that encourage innovative and differentiated instruction in diverse settings.

Implications of the effects of reading grade level mathematics assessment items on student performance on the Texas Assessment of Knowledge and Skills were discussed and analyzed in Lamb (2010). Even when students read on grade level they can struggle with technical and mathematical vocabulary. Many teachers in content areas have to teach reading strategies as part of their curriculum. Lamb (2010) found that students who do not have a strong ability to read and are also struggling with mathematics are more likely to perform poorly on assessments than those students who just struggle with mathematics. As
thought by Lamb (2010) the studied indicated that performance on assessments is affected by the ability of the student to read on grade level. In an ideal assessment reading difficulty would be reduced without compromising the mathematical complexity of the questions. Lamb (2010) proposed that mathematics assessments should be written as to target the reading grade level of students participating in the assessment to accurately gage mathematical performance.

Miller (2009) study evaluated how long it would take for third graders, who were reading at below grade level, to read at grade level. The study considered whether their reading levels would stay stable and if classroom assistants could effectively replace teacher tutoring. It was important to note that while the school was located in a urban Title 1 community the school’s rural population remained stable. The study did show that students who received tutoring for one year had a higher success rate on state assessments even though they were still not able to read on grade level texts. When the standard is changed from state assessments to the ability to read on grade level one year of tutoring was not enough time to establish long term results. The study did show that classroom assistants can be used as tutors effectively for student growth.

Spear-Swerling, L. (2004) examined fourth graders’ performance on two commonly used reading comprehension measures, involving a question-answering format and a cloze format, which were part of a state-mandated assessment. This study was considering the accuracy of assessment of reading comprehension for monitoring student progress and determining if the
assessment tools are used where valid. The study also examined the abilities that are important for students to have to be successful on state assessments. The results of the study found that test format should be a consideration when interpreting the reading comprehension of students. Utilizing one single format does not give a good picture of the abilities of the student and could limit the potential for additional support or intervention.

A study conducted by Harding, H. R., Harrison-Jones, L., & Rebach, H. M. (2012) examined whether provision of supplemental educational services significantly improved academic achievement of students in Baltimore City Public Schools after they received supplemental services. Harding et al considered level of student participation in the supplemental educational services, mode of instruction and its effect on participation, student demographics and schools ability to meet AYP. This study found that the most significant finding was the influence that grade level had on participation in the supplemental programs. Elementary students were more likely to attend the afterschool programs that middle school students and so received the greater benefit from attending. Participation in the programs did show results in higher test scores and directly related to a schools ability to make AYP. The authors of the study suggested that develop of strategies to increase participation by students in the programs should be implemented.

Carreker, S. H., Swank, P. R., Tillman-Dowdy, L., Neuhaus, G. F., Monfils, M., Montemayor, M., & Johnson, P. (2005) showed in their study the Hierarchical linear modeling (HLM) showed that students whose teachers were trained in
Language Enrichment instruction had higher third grade reading comprehension achievement than students whose teachers were not trained. This study suggested that teachers who have content-rich knowledge known to support literacy acquisition can provide reading instruction that results in a level of reading comprehension that is significantly higher than that resulting from teachers.

In considering if intervention and differentiated instruction can make a significant change to high-stakes testing the study conducted by Mercer, C. D., Campbell, K. U., Miller, M., Mercer, K. D., & Lane, H. B. (2000) looked at a fluency-reading intervention to supplement reading instruction of middle school students with learning disabilities (LD).

In another study looking at the outcomes of using online instruction to support classroom teaching to raise standard testing results found that the online program had significant impact on the end results (Martindale, et al, 2005). The development of computer-based and web-based software applications has been a reaction of the concern for preparation for high-stakes testing. Computer and web-based programs can be utilized for drill-and-practice, introduction of new topics or enrichment of topics covered in the classroom. The results of the study indicated that fourth and fifth grade students who used the computer and web-based program achieved higher scores compared to those students who did not use the programs. The eight and tenth grade students used in the student showed no significant difference between groups. The computer programs show
positive results for elementary grade students but financial cost of software programs could be prohibitive to their use in schools.

Wood, Hill, Meyer & Flowers (2005) considered the predictive assessment of reading and its ability to determine the student’s future reading level. As was also show in Spear-Swerling, L. (2004) to effectively predict reading ability and outcomes more than one assessment predictor needs to be used, the criterion needs to include comprehension as well as single word or pseudo word decoding. The results of the study show an uncommonly strong predictive value to future reading levels. Interestingly enough the study also found the pertinence of phonemic awareness, measured in early elementary, predicts half of the variance in a standardly administered reading achievement test given in eighth grade (Wood et. al. 2005).
Research Methods

Research Design

A linear regression analysis was conducted to see if Study Island Scores could predict MAP Assessment score outcomes. If a prediction relationship is established intervention instructional strategies can be implemented with students prior to taking the current grade level MAP assessment. The independent variable is Study Island Benchmark assessment scores. The dependent variable is MAP assessment scores.

Study Group Description

The study group selected for this regression analysis was the students who were in sixth grade in 2010, seventh grade in 2011 and eighth grade in 2012 who have scores from both Study Island Benchmark assessment and MAP assessment. The school district used in this study has a student population K-12 of 277 for the 2012-2013 school year. Of the 277 students enrolled 93.9% are White, 4.3% are African American, .7% are Hispanic, .7% are Asian and .4% are of Native American origin. 55.9% of the students utilize the free reduced lunch program.

Data Collection and Instrumentation

 Archived data from the school district studied was collected on the MAP Math and Communication Arts assessments from the 2009-2010, 2010-2011, and 2011-2012 school years. Archived data in the Study Island web based program was collected for the 2009-2010, 2010-2011, and 2011-2012 school years. The student population were those who attended the school district
studied during their sixth (2009-2010), seventh (2010-2011), and eighth (2011-2012) grade year. Only those students who had data for both Study Island and MAP were used in this study.

**Statistical Analysis Methods**

A linear regression analysis was conducted to see if MAP Assessment scores could be predicted from Study Island Benchmark assessment scores.
Findings

6th Grade Com Arts 2010

Simple Linear Regression Analysis (SLR) Research Question: Can the Missouri Assessment Program Communication Arts (MAPScale CA) score be predicted from the Study Island web-based program Communication Arts benchmark (Study Island CA) score?

Table 1: Regression Analysis for Study Island CA vs. MAPScale CA

<table>
<thead>
<tr>
<th>Source</th>
<th>Beta Coef.</th>
<th>R²</th>
<th>SEE</th>
<th>F</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>296.17</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Study Island CA</td>
<td>14.48</td>
<td>0.40</td>
<td>40.47</td>
<td>11.37</td>
<td>0.0036</td>
</tr>
</tbody>
</table>

Alpha = 0.25

As shown in Table 1, simple linear regression was calculated predicting subject’s MAPScale score based on their Study Island CA score. A significant regression equation was found ($F (1, 17) = 11.37, p = 0.0036$), with an $R^2$ of 0.40. Subjects’ predicted MAPScale CA score is equal to $14.48 + 296.17$ Study Island CA.

Subjects’ average MAPScale CA score increased 296.17 points for an increase of one Study Island CA score with an SEE of +/-40.47.

Can the MAPScale CA score be predicted from the Study Island CA score?

- Model Power.
  - $R$ squared (0.40) indicates a practical model that accounts for about 40% of the variance between the two variables.
  - Standard Error of the Estimate (SEE) finding suggests that the predicted MAPScale CA is accurate +/- 40.47 points at one standard deviation.
It can be concluded that the model has moderate to power and accuracy.

- **Model Significance.**
  - F (11.37) has low relative value when compared to zero.
    - This indicates that there is a significant chance that a Type One Error would be made if the null hypothesis was rejected.
  - P Value (0.0036) indicates that we can be 100% sure that a Type One Error will not occur. The SLR model is significant.
    - It can be concluded that the model null hypothesis can be rejected.

- **SLR Model** can be constructed from the beta coefficient results. The model is…
  - Y' = 14.48 + 296.17 Study Island CA
  - Or, for every run (increase) of 1 Study Island CA score the student can expect to raise (increase) their MAPScale CA score by 14.48.
  - The final predicted value is accurate +/- 40.47 MAPScale CA score points.

**Conditions:** Confidence Limits = 95

- Value for Study Island CA = 27
- Forecast = 687.26
- Lower = 599.52
- Upper = 774.99
7th Grade Com Arts 2011

Simple Linear Regression Analysis (SLR) Research Question: Can the Missouri Assessment Program Communication Arts (MAPScale CA) score be predicted from the Study Island web-based program Communication Arts benchmark (Study Island CA) score?

Table 2: Regression Analysis for Study Island CA vs. MAPScale CA

<table>
<thead>
<tr>
<th>Source</th>
<th>Beta Coef.</th>
<th>R²</th>
<th>SEE</th>
<th>F</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>598.64</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Study Island CA</td>
<td>3.74</td>
<td>0.82</td>
<td>11.00</td>
<td>68.27</td>
<td>5.77E-7</td>
</tr>
</tbody>
</table>

Alpha = 0.25

As shown in Table 2, simple linear regression was calculated predicting subject's MAPScale CA score based on their Study Island CA score. A significant regression equation was found (F (1, 15) = 68.27, p = 5.77E-7), with an R² of 0.82. Subjects’ predicted MAPScale CA score is equal to 3.74 + 598.64 Study Island CA. Subjects’ average MAPScale CA score increased 598.64 points for an increase of one Study Island CA score with an SEE of +/-11.00.

Can the MAPScale CA score be predicted from the Study Island CA score?

- Model Power.
  - R squared (0.82) indicates a practical model that accounts for about 82% of the variance between the two variables.
  - Standard Error of the Estimate (SEE) finding suggests that the predicted MAPScale CA is accurate +/- 11.00 points at one standard deviation.
It can be concluded that the model has significant power and low accuracy.

- **Model Significance.**
  - F (68.27) has high relative value when compared to zero.
    - This indicates that there is little chance that a Type One Error would be made if the null hypothesis was rejected.
  - P Value (5.77E-7) indicates that we can be 100% sure that a Type One Error will not occur. The SLR model is very significant.
  - It can be concluded that the model null hypothesis can be rejected with significant confidence.

- **SLR Model** can be constructed from the beta coefficient results. The model is...
  - Y’ = 3.74 + 598.64 Study Island CA
  - Or, for every run (increase) of 1 Study Island CA score the student can expect to raise (increase) their MAPScale CA score by 3.74.
  - The final predicted value is accurate +/- 11.00 MAPScale CA score points.

**Conditions:** Confidence Limits = 95

Value for Study Island CA = 21

Forecast = 677.12

Lower = 652.95

Upper = 701.29
Simple Linear Regression Analysis (SLR) Research Question: Can the Missouri Assessment Program Communication Arts (MAPScale CA) score be predicted from the Study Island web-based program Communication Arts benchmark (Study Island CA) score?

Table 3: Regression Analysis for Study Island CA vs. MAPScale CA

<table>
<thead>
<tr>
<th>Source</th>
<th>Beta Coef.</th>
<th>R²</th>
<th>SEE</th>
<th>F</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td></td>
<td>616.31</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Study Island CA</td>
<td>4.47</td>
<td>0.45</td>
<td>23.55</td>
<td>7.44</td>
<td>0.0233</td>
</tr>
</tbody>
</table>

Alpha = 0.25

As shown in Table 3, simple linear regression was calculated predicting subject’s MAPScale CA score based on their Study Island CA score. A significant regression equation was found ($F (1, 9) = 7.44, p = 0.0233$), with an $R^2$ of 0.45. Subjects’ predicted MAPScale CA score is equal to $4.47 + 616.31$ Study Island CA. Subjects’ average MAPScale CA score increased 616.31 points for an increase of one Study Island CA score with an SEE of $\pm 23.55$.

Can the MAPScale CA score be predicted from the Study Island CA score?

- Model Power.
  - $R$ squared (0.45) indicates a practical model that accounts for about 45% of the variance between the two variables.
  - Standard Error of the Estimate (SEE) finding suggests that the predicted MAPScale CA is accurate $\pm 23.55$ points at one standard deviation.
• It can be concluded that the model has moderate power and low accuracy.

• Model Significance.
  o F (7.44) has low relative value when compared to zero.
    ▪ This indicates that there is a significant chance that a Type One Error would be made if the null hypothesis was rejected.
  o P Value (0.0233) indicates that we can be 100% sure that a Type One Error will not occur. The SLR model is very significant.
  o It can be concluded that the model null hypothesis can be rejected.

• SLR Model can be constructed from the beta coefficient results. The model is…
  o Y’ = 4.47 + 616.31 Study Island CA
  o Or, for every run (increase) of 1 Study Island CA score the student can expect to raise (increase) their MAPScale CA score by 4.47.
  o The final predicted value is accurate +/- 23.55 MAPScale CA score points.

Conditions: Confidence Limits = 95

  Value for Study Island CA = 21

Forecast = 710.25

Lower = 653.69

Upper = 766.82
Simple Linear Regression Analysis (SLR) Research Question: Can the Missouri Assessment Program Math (MAPScale Math) score be predicted from the Study Island web-based program math benchmark (Study Island Math) score?

Table 4: Regression Analysis for Study Island Math vs. MAPScale Math

<table>
<thead>
<tr>
<th>Source</th>
<th>Beta Coef.</th>
<th>R²</th>
<th>SEE</th>
<th>F</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>575.82</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Study Island Math</td>
<td>6.42</td>
<td>0.79</td>
<td>17.48</td>
<td>22.77</td>
<td>0.003</td>
</tr>
</tbody>
</table>

Alpha = 0.25

As shown in Table 4, simple linear regression was calculated predicting subject’s MAPScale Math score based on their Study Island Math score. A significant regression equation was found \((F (1, 6) = 22.77, p = 0.003)\), with an \(R^2\) of 0.79. Subjects’ predicted MAPScale Math score is equal to \(6.42 + 575.82\) Study Island Math. Subjects’ average MAPScale Math score increased 575.82 points for an increase of one Study Island Math score with an SEE of +/-17.48.

Can the MAPScale Math score be predicted from the Study Island CA score?

- Model Power.
  - \(R^2\) squared (0.79) indicates a practical model that accounts for about 79% of the variance between the two variables.
  - Standard Error of the Estimate (SEE) finding suggests that the predicted MAPScale Math is accurate +/- 17.48 points at one standard deviation.
  - It can be concluded that the model has significant power and mild accuracy.
• Model Significance.
  o F (22.77) has low relative value when compared to zero.
    ▪ This indicates that there is a little chance that a Type One Error would be made if the null hypothesis was rejected.
  o P Value (0.003) indicates that we can be 100% sure that a Type One Error will not occur. The SLR model is significant.
  o It can be concluded that the model null hypothesis can be rejected with confidence.

• SLR Model can be constructed from the beta coefficient results. The model is…
  o Y’ = 6.42 + 575.82 Study Island Math
  o Or, for every run (increase) of 1 Study Island Math score the student can expect to raise (increase) their MAPScale Math score by 6.42.
  o The final predicted value is accurate +/- 17.48 MAPScale Math score points.

Conditions: Confidence Limits = 95

Value for Study Island Math = 21

Forecast = 710.62

Lower = 665.15

Upper = 756.08
7th Grade Math 2011

Simple Linear Regression Analysis (SLR) Research Question: Can the Missouri Assessment Program Math (MAPScale Math) score be predicted from the Study Island web-based program math benchmark (Study Island Math) score?

Table 5: Regression Analysis for Study Island Math vs. MAPScale Math

<table>
<thead>
<tr>
<th>Source</th>
<th>Beta Coef.</th>
<th>R²</th>
<th>SEE</th>
<th>F</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>625.16</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Study Island Math</td>
<td>4.98</td>
<td>0.87</td>
<td>13.30</td>
<td>102.70</td>
<td>2.28E-8</td>
</tr>
</tbody>
</table>

Alpha = 0.25

As shown in Table 5, simple linear regression was calculated predicting subject’s MAPScale Math score based on their Study Island Math score. A significant regression equation was found (F (1, 16) = 102.70, p = 2.28E-8), with an R² of 0.87. Subjects’ predicted MAPScale Math score is equal to 4.98 + 625.16 Study Island Math. Subjects’ average MAPScale Math score increased 575.82 points for an increase of one Study Island Math score with an SEE of +/-13.30.

Can the MAPScale Math score be predicted from the Study Island CA score?

- Model Power.
  - R squared (0.87) indicates a practical model that accounts for about 87% of the variance between the two variables.
  - Standard Error of the Estimate (SEE) finding suggests that the predicted MAPScale Math is accurate +/- 13.30 points at one standard deviation.
  - It can be concluded that the model has significant power and accuracy.
• Model Significance.
  o F (102.70) has significant relative value when compared to zero.
    ▪ This indicates that there no chance that a Type One Error
      would be made if the null hypothesis was rejected.
  o P Value (2.28E-8) indicates that we can be 100% sure that a Type
    One Error will not occur. The SLR model is very significant.
  o It can be concluded that the model null hypothesis can be rejected
    with significant confidence.

• SLR Model can be constructed from the beta coefficient results. The
  model is…
  o \( Y' = 4.98 + 625.16 \) Study Island Math
  o Or, for every run (increase) of 1 Study Island Math score the
    student can expect to raise (increase) their MAPScale Math score
    by 4.98.
  o The final predicted value is accurate +/- 13.30 MAPScale Math
    score points.

Conditions: Confidence Limits = 95

Value for Study Island Math = 21

Forecast = 729.78

Lower = 700.12

Upper = 759.43
Conclusions and Recommendations

In conclusion, there was a very small sample size to generate data for this research study. The sixth, seventh and eighth grade class sizes for all three years studied were below twenty students. In all the data the analysis did show that predictions could be made on the student outcome for the Missouri Assessment Program. With this knowledge the school could provide interventions to those students who do not demonstrate proficiency.

The purpose of this study was to examine the predictability of the study island benchmark scores to the Missouri Assessment Program scores, a high-stakes state assessment that measures student progress. Table 1 sample consisted of seventeen students attending the district in the 2009-2010 school year. Only students who took both the Study Island benchmark and Missouri Assessment Program at the school district were analyzed. The simple linear regression analysis indicated a 40% variance between the two variables with a standard error of the estimate +/-40.47. This model indicated moderate power and accuracy. The simple linear regression analysis for communication arts sixth grade shows significance and the null hypotheses; Study Island Benchmark assessment scores cannot predict MAP assessment scores can be rejected as indicated by the p value of 0.0036. Confidence limits of 95 indicate that the MAPScale CA score can be predicted to fall within the 599.52 (lower) – 774.99 (upper) range with a forecast of 687.26 which indicates a proficient on the high-stakes assessment.
Table 2 sample consisted of fifteen students attending the district in the 2010-2011 school year. Only students who took both the Study Island benchmark and Missouri Assessment Program at the school district were analyzed. The simple linear regression analysis indicated an 82% variance between the two variables with a standard error of the estimate +/-11.00. This model indicated significant power and low accuracy. The simple linear regression analysis for communication arts seventh grade shows significance and the null hypotheses; Study Island Benchmark assessment scores cannot predict MAP assessment scores can be rejected as indicated by the p value of 5.77E-7. Confidence limits of 95 indicate that the MAPScale CA score can be predicted to fall within the 652.95 (lower) – 701.29 (upper) range with a forecast of 677.12 which indicates a proficient on the high-stakes assessment.

Table 3 sample consisted of nine students attending the district in the 2011-2012 school year. Only students who took both the Study Island benchmark and Missouri Assessment Program at the school district were analyzed. The simple linear regression analysis indicated a 45% variance between the two variables with a standard error of the estimate +/-23.55. This model indicated moderate power and low accuracy. The simple linear regression analysis for communication arts eighth grade shows significance and the null hypotheses; Study Island Benchmark assessment scores cannot predict MAP assessment scores can be rejected as indicated by the p value of 0.0233. Confidence limits of 95 indicate that the MAPScale CA score can be predicted to
Can MAP scores fall within the 653.69 (lower) – 766.82 (upper) range with a forecast of 653.69 which indicates an advanced on the high-stakes assessment.

Table 4 sample consisted of six students attending the district in the 2009-2010 school year. Only students who took both the Study Island benchmark and Missouri Assessment Program at the school district were analyzed. The simple linear regression analysis indicated a 79% variance between the two variables with a standard error of the estimate +/-22.77. This model indicated significant power and mild accuracy. The simple linear regression analysis for mathematics sixth grade shows significance and the null hypotheses; Study Island Benchmark assessment scores cannot predict MAP assessment scores can be rejected with confidence as indicated by the p value of 0.003. Confidence limits of 95 indicate that the MAPScale Math score can be predicted to fall within the 665.15 (lower) – 756.08 (upper) range with a forecast of 710.62 which indicates a proficient on the high-stakes assessment.

Table 5 sample consisted of sixteen students attending the district in the 2010-2011 school year. Only students who took both the Study Island benchmark and Missouri Assessment Program at the school district were analyzed. The simple linear regression analysis indicated an 87% variance between the two variables with a standard error of the estimate +/-13.30. This model indicated significant power and accuracy. The simple linear regression analysis for mathematics seventh grade shows significance and the null hypotheses; Study Island Benchmark assessment scores cannot predict MAP assessment scores can be rejected with confidence as indicated by the p value
Can MAP scores 29

of 2.28E-8. Confidence limits of 95 indicate that the MAPScale Math score can be predicted to fall within the 700.12 (lower) – 759.43 (upper) range with a forecast of 729.78 which indicates an advanced on the high-stakes assessment.

With all schools having concerns for student performance on state achievement tests and these high-stakes tests being linked to AYP, schools would be wise to consider incorporating additional predictive data tools to their daily curriculum. Computer and web-based programs becomes another tool for use by districts to anticipate and potentially improve high-stakes state assessment scores. Providing opportunities for differentiation of instruction and improving student learning is a goal being sought at most primary and secondary institutions. Establishing validity in predicting future outcomes for high-stakes state assessments lends support to the use of financial resources when funding is scarce.

Sample size for the research was of limited size and so any future research should be conducted utilizing a larger student pool incorporating information from other districts within the state who are also utilizing the same web-based program. Currently the Missouri Assessment Program test and End of Course exams are being revamped to implement the introduction of Common Core Standards. The Study Island web-based program has already provided the opportunity for educators and schools to select the program tools they would like for their students to use. It would be interesting to track students from third grade through each year’s assessment to see if the predictive quality holds true for the Common Core Standards.
References


