PREDICTING ACT SCORES FROM ENGLISH II END-OF-COURSE EXAM

By

KATHERINE KIMBLE

Submitted to
The Educational Leadership Faculty
Northwest Missouri State University Missouri
Department of Educational Leadership
College of Education and Human Services
Maryville, MO 64468

Submitted in Fulfillment for the Requirements for
81-693 Research Paper
Fall 2012

July 20, 2013
ABSTRACT

The purpose of the study was to determine if the English II End-of-Course state assessment has a predictive power for the ACT reading subscore. The current educational environment is governed by excessive amounts of state and national assessments. Students feel pressure to perform well on assessments that determine acceptance to higher education. The findings of this study should increase student motivation to utilize scores from the mandated state assessment to better prepare for the ACT. The result of the study indicates that a significant predictive power exists between English II End-of-Course scores and ACT reading subscores. The study also indicates that a significant predictive power exists between English II End-of-Course scores and ACT composite scores.
INTRODUCTION TO STUDY

Background, Issues, and Concerns

Mandated state and national assessments are currently a substantial part of public education. Under *No Child Left Behind* (NCLB), state and national assessments are used to determine teacher effectiveness and students preparedness for higher education and vocation. Some states are even using state and national assessments to evaluate teacher tenure and determine salary compensation. In a time of high-stakes tests, the power to predict students’ scores could be constructive.

The Missouri Assessment Program “assesses students’ progress towards mastery of the Show-Me Standards, which are the educational standards in Missouri” (Missouri Department of Elementary and Secondary Education, 2011, para. 1). Missouri’s state assessment is known at the high school level as the End-of-Course (EOC) exam. Missouri EOC assessments are required “in the subject areas of Algebra I, Biology, English II, and Government. Beginning with the class of 2016, American History and English I are also required.” (Missouri Department of Elementary and Secondary Education, 2011, para. 1) All public education students are required to take the EOC exams unless a student has an Individualized Educational Plan (IEP) whose team determined that the MAP-A is a suitable replacement, an English Language Learner (ELL) student has been in the United States for 12 months or less, or a foreign exchange student. The scores from the EOC exams are used to determine a school’s adequate yearly progress towards proficiency, which is set by Missouri’s Department of Elementary and Secondary Education.

The American College Testing (ACT) was “introduced in 1959 as a competitor to the SAT” (Atkinson & Geiser, 2009, p. 665). Many university and college admissions require an
ACT score to determine college-readiness of applicants. Although high school grade-point-average is used to determine acceptance into most higher education institutions, an ACT score can offer students automatic acceptance because most higher education institutions view the assessment as impartial and comprehensive. Since the ACT uses a bell curve distribution, students are forced to compete against one another to attain a successful score. Content assessed on the ACT is aligned to College and Career Readiness Standards and is used to predict success in college-level courses (Conrad-Curry, 2011).

Practice Under Investigation

All students in the state of Missouri are required to complete an End-of-Course assessment after completing English II. Most students who are interested in attending higher education are required to take an admissions exam, typically either ACT or SAT.

School Policy to be Informed by Study

Should a predictive power be found between the English II End-of-Course and the reading ACT subtest, educators and students could use the information presented by the state-required EOC exam to better prepare for the ACT.

Conceptual Underpinnings for the Study

Modern-day educators are pulled in several different directions regarding state-mandated and national assessments. Students are constantly bombarded with testing. For example, in the Saint Joseph School District, sophomore students enrolled in Communication Arts 10 are required to take four district benchmarks and one state assessment, not including classroom unit tests. In the words of a 10th-grade student: “The worst part about testing is there are so many tests in such a small time frame, that it becomes impossible to excel in all areas (T. Catron, personal communication, May 7,
End-of-Course exams dictate state accreditation and funding; however, the scores are not recorded on students’ transcripts. Making the EOC exam relevant to students is a difficult but important task since state funding is tied to the test scores. Essentially, the EOC should evaluate a student’s mastery of the Communication Arts 10 curriculum; therefore, material that is tested on the English II EOC should also be applicable on the ACT exam. The ACT exam is a relevant assessment for students since it affects college acceptance and scholarship acquiescence. If the results of the English EOC have predictive power for the ACT, then students will have a better understanding of their progress towards college-readiness and will be able to target areas of improvement. Students can use the information to plan future course-work and schools can use the information to assign remedial reading programs or advanced courses.

Statement of the Problem

In recent years, educators have been under escalating pressure to increase student test scores on state and national assessments. This has created a trickle-down effect. Students have also felt the pressure to increase ACT test scores due to rigorous university-acceptance and scholarship requirements. On top of the mounting mandated assessments, teachers face the difficulty of meeting the demands of the standards set by No Child Left Behind and a new national curriculum known as the Common Core State Standards. Understanding if a predictive power exits between the state-mandate English II End-of-Course and the ACT exam, allows teachers and students to work together to meet each child’s academic needs.
Purpose of the Study

The purpose of the study is to determine the correlation between English II End-of-Course scores and the reading subscore of the ACT assessment. In this study, there are two variables measured. The independent variable will be the English II End-of-Course exam scores taken during the sophomore year of high school. The dependent variable will be the most recent recorded reading subscore of the ACT assessment.

Research Question

In this study, there is one research question.

RQ: Does the English II End-of-Course assessment have a predictive power for the ACT reading subscore?

Null Hypothesis

H₀. The English II End-of-Course assessment does not have predictive power for the ACT reading subscore.

Anticipated Benefits of the Study

The result of this study will determine the predictive power between the English II End-of-Course results and the reading subscore of the ACT assessment.

Definition of Terms

A representation of key terminology used throughout the research study.

End-of-Course (EOC)- Exam created by the Missouri Assessment Program that assesses the mastery of Show-Me Standards. The EOC assessment is given to high school students enrolled in Algebra I, Biology, English II, and Government. (Missouri Department of Elementary and Secondary Education, 2011)
American College Test (ACT)- American College Testing Program assessment introduced in 1959 to ensure academic preparation for higher education

No Child Left Behind (NCLB)- The Elementary and Secondary Education Act was amended by Congress in 2002 and reauthorized under the new name of No Child Left Behind

Elementary and Secondary Education Act (ESEA)- The bill was passed in 1965 as part of President Lyndon B. Johnson’s “War on Poverty”

DESE- Missouri Department of Secondary and Elementary Education

Summary

Modern-day educators and students face a barrage of required assessments. Under No Child Left Behind, students are required to complete state assessments. Missouri’s Department of Elementary and Secondary Education mandates students complete an End-of-Course assessment for most core subjects. After the completion of sophomore English, students are required to complete the English II End-of-Course exam. The ACT and SAT are popular college-acceptance exams; however, the ACT is the most common among higher educational institutions located in the Midwest. Since the English II EOC is required for all students who attend public education in Missouri, the results could be used to better prepare students for the ACT and understand targeted areas needed for improvement to meet college-readiness standards. The primary purpose of the study is to determine the predictive power of the English II End-of-Course exam to the reading subscore of the ACT assessment.
The Elementary and Secondary Education Act (ESEA) was introduced during President Lyndon B. Johnson’s “War on Poverty” and passed in 1965 (Elementary and Secondary Education Act, 2013). According to Jeffrey (1972), the principle contribution behind the “War on Poverty” that led to a federal educational bill was that “inadequate education and poverty” were directly linked. Before the Elementary and Secondary Education Act, very little focus was given to education at the federal level; most educational decisions were left up to states and governing bodies of school districts (Elementary and Secondary Education Act, 2013). Due to the lack of federal government regulation, there were several discrepancies between the education students were receiving when compared by states. The passage of the Elementary and Secondary Education Act ensured the creation of national educational standards and the ability to hold districts accountable (Elementary and Secondary Education Act, 2013).

In 2002, the Elementary and Secondary Education Act was amended and reauthorized under a new name, No Child Left Behind (Elementary and Secondary Education Act, 2013). Congress was unsatisfied with the lack of advancement of public education; therefore, a revived framework was created under NCLB to quicken the progress to meet national standards (Hall, 2013). No Child Left Behind (NCLB) substantiated the belief that “public education requires a federal presence to ensure academic progress and academic equality for all students” (Schmidt, 2008, p. 8). The reauthorization of NCLB widened the means for public education’s accountability to ensure that students, at the point of high school graduation, would meet career-and-college-readiness standards. NCLB measured the progress of students, while breaking down data
by groups: white, black, Indian, Hispanic, Asian, low-income, and English-language learners. According to Hall (2013), the accountability provided under NCLB was “not just a groundbreaking step in educational policy, but also a major piece of civil rights legislation” (p. 1).

Standardized test scores are used to determine school districts’ accountability for student achievement under the No Child Left Behind Act of 2001 (High-Stakes Testing and Student Achievement). According to Nichols, Glass, and Berliner (2005), “each state is responsible for constructing an accountability system, attaching consequences- or stakes-for student performance. The theory of action implied by this accountability program is that the pressure of high-stakes testing will increase student achievement” (p. 1).

Missouri’s Department of Elementary and Secondary Education (DESE) created the Missouri Assessment Program to satisfy the requirements of NCLB. Under NCLB, states are mandated to assess and report scores for 95% of the student population, including special education and English-language learners (Blank, 2011). Show-Me Standards are the educational standards that are used by the Missouri Assessment Program to determine grade-level proficiency. The Missouri Assessment Program’s examination is known at the secondary level as the End-of-Course (EOC) exam, which is required for Algebra I, Biology, English II, and Government (Missouri Department of Elementary and Secondary Education, 2011). Based on individual student groups and overall student testing performances on the assessment, adequate yearly progress (AYP) is determined for the school. A proficiency objective is set by the state and must be met by each demographic student group for the school to meet AYP (Blank, 2011).

The American College Testing Program (ACT) was introduced in 1959 “as a competitor to the SAT” (Atkinson & Geiser, 2009). The ACT and SAT are both widely
accepted today by universities and colleges as a major determinant in the post-secondary educational acceptance process. According to Conrad-Curry (2011), the ACT is considered a successful predictor of college success and “has acted as a gatekeeper to many of the country’s institutions of higher education, especially in the Midwest” (p. 28). The ACT is comprised of four multiple-choice tests: English, Mathematics, Reading, and Science (Description of the ACT, 2013). The reading subtest is comprised of four passages: Prose Fiction, Social Science, Humanities, and Natural Science. Each passage has 10 multiple-choice questions; therefore, the reading test has a total of 40 multiple-choice questions and students have 35 minutes to complete. Scale scores range from a bell curve distribution from 1 to 36 (Conrad-Curry, 2011). The ACT is considered an achievement test that assess what a student knows and comprehends from a typical high school curriculum; students who have completed rigorous high school course work should score the highest on the exam (What Kind of Test Preparation is Best?, 2005). According to ACT, Inc. (The Condition of College Readiness, 2009), “for each year from 2005 to 2009, ACT composite and subject scores were higher for students who completed or planned to complete a core curriculum or more in high school than for students who did not” (p. 6). In the United States, students share an ubiquitous pressure to succeed on assessments that higher education institutions has deemed mandatory for acceptance.

A regression analysis is used to predict future behavior from past behavior. According to Barmann (2004), “the purpose of regression analysis is to learn more about the relationship between one or more independent or predictor variables and a dependent or criterion variable” (PowerPoint slide #4). A single regression analysis is used in education to allow one measurement to predict another measurement and is “ideal for
picking up trends in time series data” (Bozarth, 2011, para. 2). In this study, the single regression analysis demonstrates the predictive power of the English II EOC on the ACT assessment.
RESEARCH DESIGN AND METHODOLOGY

Research Design

A regression analysis was used in this study. Alpha level was set at 0.15 to determine significance from the regression analysis. The English II End-of-Course raw scores were compared with most recent recorded overall ACT score and ACT reading subscore. The independent variable will consist of raw scores from the English II End-of-Course exam. The dependent variable will consist of ACT reading subscores (Table 1) and overall ACT scores (Table 2). The ACT exam is divided into four sections: English, mathematics, reading, and science. The reading ACT subscore, instead of the English ACT subscore, was used for the study because the English II End-of-Course focuses on reading skills; therefore, the reading portion of the ACT aligns more closely with the English II EOC. A simple linear regression analysis, with an alpha level of 0.15, was used to determine predictive power between the dependent and independent variable.

Simple linear regression

Study Group

The study group consisted of 100 tenth through twelfth grade students in a suburban school district. All students were randomly selected from the student population. Approximately 1,560 students are enrolled in this school, with 43.2% receiving free or reduced lunch. The demographic profile for the student population is 82.5% White, 8.8% Black, 5.1% Hispanic, and 2.4% Asian (MODESE, 2012).

Data Collection and Instrumentation

Data was collected from the school database, PowerSchool. The data consisted of each students' most recent ACT overall score and subtest scores. The data also contained
the English II EOC raw score. Data was placed in an excel spreadsheet without any identifying characteristics for individual students.

*Data Analysis Methods*

A Statistical Package was used to complete the statistical calculations in this study. The single regression analysis was performed to determine the predictive power between English II EOC raw scores and ACT reading subscores.
FINDINGS

Table 1: Regression Analysis for English II End-of-Course vs. ACT Reading

Model: $ACT = 0.78314EOC + 0.711742CNST$

<table>
<thead>
<tr>
<th>Source</th>
<th>Beta Coef.</th>
<th>$R^2$</th>
<th>SEE</th>
<th>F</th>
<th>p-value</th>
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</thead>
<tbody>
<tr>
<td>Constant</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EOC</td>
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<td>0.368</td>
<td>4.58914</td>
<td>56.5594</td>
<td>2.76E-11</td>
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</table>

Alpha = 0.15

As shown in Table 1, a simple regression analysis was calculated to predict the ACT reading subscores of students based on the English II EOC raw scores. The most recent ACT reading subscore was collected from 100 students. The EOC English II raw scores were collected from the same 100 students. The English II EOC scores were used for the independent variable. The ACT reading subscores were used for the dependent variable. A significant equation was found ($F(1/98)=56.5594, p<0.15$), with an $R^2$ of 0.368. Subjects predicted ACT reading subscore is equal to 0.712 + 0.78 EOC. Subjects’ average ACT reading subscore increased 0.78 points for an increase of one English II EOC score with an SEE of +/- 4.59. There is a 95% confidence limits for a single forecast. For a student who scores a 27 raw score on the English II EOC, the student’s forecast ACT reading subscore is 21.86. The lower forecast is 12.7 and the upper forecast is 31.01. It can be concluded that the model null hypothesis can be rejected with great confidence. For every increase of 1 English II EOC score the student can expect to raise his ACT reading subscore by 0.78 points.
Table 2: Regression Analysis for English II End-of-Course vs. Composite ACT

Model: ACT = 0.656931EOC + 3.91708CNST

<table>
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<tr>
<th>Source</th>
<th>Beta Coef.</th>
<th>$R^2$</th>
<th>SEE</th>
<th>F</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.656931</td>
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<tr>
<td>EOC</td>
<td>3.91708</td>
<td>0.358</td>
<td>3.92794</td>
<td>54.325</td>
<td>5.69E-11</td>
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</tbody>
</table>

Alpha = 0.15

As shown in Table 2, a simple regression analysis was calculated to predict the composite ACT score of students based on the English II EOC raw scores. The most recent ACT composite score was collected from 100 students. The EOC English II raw scores were collected from the same 100 students. The English II EOC scores were used for the independent variable. The ACT composite scores were used for the dependent variable. A significant equation was found ($F(1/97)= 54.325, p <0.15$), with an $R^2$ of 0.358. Subjects predicted ACT reading subscore is equal to $3.917 + 0.66$ EOC. Subjects’ average ACT composite score increased 0.66 points for an increase of one English II EOC score with an SEE of +/- 3.93. There is a 95% confidence limits for a single forecast. For a student who scores a 27 raw score on the English II EOC, the student’s forecast composite ACT score is 21.65. The lower forecast is 13.8 and the upper forecast is 29.5. For every increase of 1 English II EOC score the student can expect to raise his ACT composite score by 0.66 points.
CONCLUSIONS AND RECOMMENDATIONS

The results of this study show that there is a significant predictive power between the English II EOC scores and ACT reading subscores. The results of the study also show that there is a significant predictive power between the English II EOC scores and ACT overall composite score. Some people may question why there is a predictive power for the ACT overall composite score since it includes mathematics and science. The ability to read well is an essential component of mastering the ACT test; each subtest, including mathematics and science, require the student to read carefully to understand the content of the questions and material presented. Now that a predictive power has been determined, students can use one assessment to prepare and excel for another assessment; therefore, working to eliminate students feeling like exams do not assess similar material. Based on the findings of the study, teachers can use students’ English II EOC scores to develop a differentiated course of study to ensure increased success on the ACT assessment. Now, students can use their English II EOC scores as a benchmark to determine readiness for the ACT. Likewise, the results of the study should increase student motivation for the English II EOC once students understand the predictive power. The study is intended to make the state-required EOC relevant to students and the findings should accomplish that result.

There were several limitations in the present study that should be addressed in future research. For the current study, the most recent ACT score was used for each student. Future research should examine the predictive power between English II EOC scores and the first ACT score recorded per student. It would be interesting to see if there is a difference when the first ACT score is used, since for some students in the study, the most recent ACT score could have been their second or third time taking the ACT test.
Future research should examine the motivation aspect of the study. Does understanding the predictive power between the English II EOC and the ACT assessment increase motivation on the English II EOC? If so, English II EOC scores could be expected to increase. Future research should also study the predictive power between Algebra I EOC scores and ACT mathematics subscores and the predictive power between Biology EOC scores and ACT science subscores.

With the current movement towards Common Core State Standards (national educational standards), I would recommend a study be conducted researching the affect of the new national standards on both EOC assessments and the ACT. Next Generation assessments will be used to assess the mastery of Common Core State Standards. The Next Generation assessments will be the same state to state. Currently, every state has some form of an End-of-Course assessment for English, mathematics, and science. A future study could use the national assessment to assess the rigorousness of each state's End-of-Course assessments.

Due to the novelty of this study, the findings will be beneficial to both educators and students. As proven by the findings in this study, a subject's average ACT composite score increased 0.66 points for an increase of one English II EOC score. Also, a subject's average ACT reading subscore increased 0.78 points for an increase of one English II EOC score. A student who scores a 27 raw score on the English II EOC, the student's forecast ACT reading subscore is 21.86. The college-readiness benchmark score for reading is a 21, which means a student who scores between 25-26, even though defined as proficient by Missouri's Department of Elementary and Secondary Education, is not considered ready for a freshmen level English or Social Studies course. This study should be used to adjust
proficiency bands for the English II EOC. Now that this study has proven that a predictive power can exist between a state-mandated assessment and a national assessment, more research should be conducted to expand knowledge and relevancy.
REFERENCES


APPENDIX

Figure 1

*English II End-of-Course Raw to Scale Score Conversion Chart*

<table>
<thead>
<tr>
<th>Administration Window</th>
<th>Achievement Level</th>
<th>Raw Score</th>
<th>Scale Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring 2012</td>
<td>Advanced</td>
<td>29-35</td>
<td>225-250</td>
</tr>
<tr>
<td>Spring 2012</td>
<td>Proficient</td>
<td>21-28</td>
<td>200-224</td>
</tr>
<tr>
<td>Spring 2012</td>
<td>Basic</td>
<td>13-20</td>
<td>180-199</td>
</tr>
<tr>
<td>Spring 2012</td>
<td>Below Basic</td>
<td>0-12</td>
<td>100-179</td>
</tr>
<tr>
<td>Spring 2013</td>
<td>Advanced</td>
<td>33-39</td>
<td>225-250</td>
</tr>
<tr>
<td>Spring 2013</td>
<td>Proficient</td>
<td>25-32</td>
<td>200-224</td>
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<tr>
<td>Spring 2013</td>
<td>Below Basic</td>
<td>0-13</td>
<td>100-179</td>
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Figure 2

*College Readiness Benchmark Scores*

<table>
<thead>
<tr>
<th>Subject Test</th>
<th>ACT Test Score</th>
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<tbody>
<tr>
<td>English</td>
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<tr>
<td>Mathematics</td>
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</tr>
<tr>
<td>Reading</td>
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</tr>
<tr>
<td>Science</td>
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