



Critical Thinking: The Effect of Summary Writing Methods on Reading Achievement From A Global Perspective

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Introduction

The inequalities that persist through academic achievement is a heavily researched issue worldwide. Research on the measurement and effect of critical thinking skills on academic achievement is still developing, though there has been a significant amount conducted already. Researchers have found varying conclusions when looking at this topic.

McBride (2004) found that as long as the environment is structured to foster critical thinking skills, they can be taught successfully; however, Cotter (2009) disagrees and concluded that critical thinking exercises did not have a positive effect on critical thinking skills. The varying viewpoints and also the multiple ways of approaching this topic makes the present study very relevant. Others have approached critical thinking as a predictor for exam scores, how the perceptions teachers have on critical thinking effects the students’ behavior, cultural differences in critical thinking skills, and through 15-week long course studies measuring the improvement of critical thinking skills.

Many educational theorists and academic researchers argue that when students view learning as regurgitating knowledge, they do worse in tests of academic achievement. Higher levels of critical thinking show greater achievement scores, while low levels of critical thinking have a particularly detrimental effect to student achievement (Freire, 1970) (Newman, 1996)."

Research Questions

- What is the effect of critical thinking skill levels on academic achievement?
- What variables in the child’s life contribute to their critical thinking skill level?
- How does their critical thinking skills differ based on which summary writing method they use?
- How were critical thinking skills, particularly in language arts classes, correlated with academic achievement?

Methods

Sample

This research is conducted using the PISA 2009 survey, which includes student, parent and school questionnaires in 65 countries examining about 470,000 15-year-old students’ academic achievement. The sample includes information on the parents’ backgrounds, students’ habits in schools, school resources, and much more useful information. PISA 2009 is an International, longitudinal study. A limiting factor was that there were more student responses than parent. After list wise deletion, there were 11,975 observations in the sample set.

Measures

Questions were answered using multiple choice options involving a rating scale. However, some questions on these questionnaires were yes/no questions.

Approach

This study will start first with an inductive study on each of the individual questions on achievement in the student survey, and then further explore one of those factors in much more detail.

Results

- After running OLS regressions for all variables on the student survey, these variables were the top ten most significant based off of the beta values.
- It was surprising to see that a strong influence on student achievement was that the student realized copying the text when writing a summary was not a useful strategy.
- This study is a further exploration of this surprising factor.

Table 1

Top Ten Most Significant Variables Affecting Reading Achievement Based on Beta Values	
Variable Name	Beta Value
Reads emails several times a week	0.65
Search online to learn about a particular topic several times a week	0.63
Search online to learn about a particular topic several times a month	0.57
Reads emails several times a day	0.49
Reads emails several times a month	0.46
Father’s highest schooling is ISCED Level 3A	0.46
3 or more computers available in the home	0.44
A few times a year I borrow books from the library for school	0.43
Copying the text is not a useful strategy to write a summary	0.43
2 computers available in the home	0.42

Table 2

Variable	Model with Summary Variables	Model with Summary Variables Controlled for School Variables	Model with Summary Variables Controlled for School Variables and SES Variable	Full Model
Writing the summary and then checking that each paragraph is covered is not a useful method.	-51.160***	-35.083***	-35.106***	-25.006***
barely useful	-13.431***	-10.316***	-10.341***	-8.995***
a little bit useful	-9.667***	-8.070***	-8.097***	-6.213**
useful	2.976	5.621*	5.589*	4.481*
very useful	-18.659***	-9.915***	-9.941***	-4.984*
Copying the text when writing a summary is not a useful method.	51.389***	47.180***	47.185***	37.261***
barely useful	34.891***	33.058***	33.061***	25.551***
a little bit useful	14.422***	11.235***	11.267***	8.282***
useful	-13.451***	-10.0866**	-10.093**	-7.884**
very useful	-54.604***	-44.123***	-44.116***	-30.369***
Checking whether the most important facts in the text are in the summary is not a useful method.	-47.740***	-42.466***	-42.461***	-31.526***
barely useful	-35.350***	-32.989***	-32.983***	-23.413***
a little bit useful	-16.194***	-14.960***	-14.959***	-12.649***
useful	19.985***	21.449***	21.476***	16.444***
very useful	30.089***	34.216***	34.222***	25.014***
Underlining the most important sentences then writing them in my own words is not a useful method.	-12.890**	-11.281*	-11.275*	-10.931*
barely useful	-19.489***	-14.082***	-14.079***	-13.034***
a little bit useful	-13.793***	-10.214***	-10.212***	-7.645**
useful	8.672***	7.201**	7.230**	5.977**
very useful	5.390*	8.082***	8.082***	7.536***
R2	0.214	0.349	0.349	0.490
N	11908	10390	10390	10390
bic	139242.43	119408.31	119416.56	118343.41

***This model also contained a variable asking how useful the student thought reading the text over and over again before writing the summary was. However, it did not show much significance.

- It appears that language arts skills that demonstrate low levels of critical thinking have a negative effect on student achievement. This is shown by the variable measuring how useful the student thought copying the text was when writing a summary. Looking at the coefficients, there is a constant decline as the student finds this method more useful. With a coefficient of 51.3 at not useful, and -54.6 at very useful, there is a clear correlation with reading achievement.
- This same pattern is shown by the other variables, except with a positive correlation. Making sure each paragraph is covered, making sure the important facts are included, and underlining important sentences all have rising coefficients as the student recognizes that they are useful methods.

Results

- When the school and SES variables are used as control variables, the school variables account for much more than SES. The school variables including student teacher ratio, school leadership, curriculum, school resources, student behavior, teacher participation, and ability grouping between classes. SES includes parents’ occupation, educational resources at home, wealth, and parents’ education.
- The coefficients were almost identical when controlled for school variables and when adding in SES. This is showing that SES did not have that great of an effect on these summary method variables.

Discussion

- Students with higher level of critical thinking skills have higher reading achievement scores.
- Students with high reading levels most likely have strong critical thinking skills.
- Now knowing that there is a positive correlation between critical thinking skills and reading achievement, an easy way to increase achievement scores in reading would be to focus on the students’ critical thinking skills. This can be incorporated into classroom learning but structuring the classes to promote this type of thinking
- Future research can focus on looking at whether this association differs cross-culturally. I would like to see whether certain countries have higher levels of critical thinking and whether that reflects their country-wide achievement average. This would be interesting to see whether some countries require higher levels of critical thinking.
- In a study conducted by Lun (2010) looking at Asian and Western students and which type of thinking they tended to rely on, results concluded that “these findings contribute to our understanding of the influence of culture on critical thinking in international education” (Lun, 2010). However, there is much more research to be done in this area.
- For further research to be done, a uniformed system should be created to measure critical thinking levels from questionnaires. This will result in more accurate and reliable analyses.
- This may be language arts skills effecting achievement rather than critical thinking. Future research needs to be done to distinguish this.

References and Acknowledgements

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