RUNNING HEAD: PLCs and ACT Scores

DIFFERENCES BETWEEN EXEMPLARY SCHOOLS AND NON-EXEMPLARY SCHOOLS
ON ACT SCORES IN MISSOURI

By

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ABSTRACT

The following study was conducted to see if there was a significant difference between the Composite ACT scores of schools that are recognized by the Missouri Department of Secondary and Elementary Education (DESE) as “exemplary” as opposed to those schools that are not recognized. Each year, DESE recognizes schools as “exemplary” due to their efforts and involvement with Professional Learning Communities, or PLCs. Since 2011, there have been eight high schools in Missouri that have been recognized as “exemplary.” In this study, eight other schools were chosen at random to compare ACT results with to the “exemplary” schools. After analyzing the results of this study, concerns in education relating to PLCs, and data from the state, it is shows that there is not a significant a difference in Composite ACT scores between “exemplary” schools, and those that are not.
INTRODUCTION

Background, issues and concerns.

Across the state of Missouri, concerns have come about over student performances on the ACT exam. Starting in 2014, every junior in Missouri will be required to take the ACT exam, and the scores are tied into each school’s Adequate Yearly Progress, or AYP. Not only do schools compete to offer the best education possible for their students, but ACT scores are tied into accreditation for the district. Schools have taken efforts to increase the ACT scores for their district through professional development in a variety of ways. One such measure is through the use of Professional Learning Communities. The implementation of a PLC is a multi-year process that involves numerous professional development meetings, the establishment teams and norms for all meetings, the development of curriculum, the use of summative and formative assessments, research of the latest teaching strategies, and the establishment of a collaborative school culture. Critics point out that PLCs are an added cost to the district, and that numerous professional development meetings take away from valuable instructional time for the teacher with their students. Critics also point out that the best professional development takes place within each district, not from an outside agency, such as training from DESE. The belief is that each school knows what is best for their district, and chooses not to use a “one size fits all approach.”

Practice Under Investigation

The practice under investigation in this study was analyzed using composite ACT scores. There was an investigation to see if there was a significant difference in ACT scores at “exemplary” schools as opposed to districts that are not. Through DESE, data was examined and
used to determine if students in an “exemplary” PLC school would have a greater chance at scoring higher on the ACT exam.

School policy to be informed by study.

School districts in the state of Missouri constantly make efforts to increase student performance on the ACT scores. If there is a significant difference due to the implementation of the PLC process in ACT scores, then it would be beneficial for schools to follow through with the professional development.

Conceptual underpinning.

School leaders are continually faced with a variety of challenges, especially when it comes to the professional development that they feel will benefit their staff the greatest. If leaders feel that the professional development is worthwhile, then they might pursue it, hoping to make gains in areas such as ACT scores. One type of professional development offered to schools in Missouri is the implementation of the PLC process. Many teachers are critical of the process, claiming that it takes teachers out of the classroom when they could be with their students, and that the program is not a valuable justification for using school finances. Proponents of PLCs claim that following through with the process helps staff establish clear vision and mission statements, develop norms and a positive/collaborative school culture, focus on creating worthwhile summative and formative assessments, and using data to establish goals for improvement. According to Dr. Perry Wiseman, professional development occurs through supporting the creative roles of teams, and fostering a culture of collaboration; this process occurs through the use of PLCs. (Wiseman, 2014) Wiseman also points out that districts and schools should continuously build on the implementation of PLCs to increase student achievement.
Statement of the problem.

If there is a difference between students’ scores on the ACT exams in schools that are recognized as “exemplary” by the state of Missouri, as compared to schools that are not.

Purpose of the study.

The purpose of this study was to determine if there was a significant difference in Composite ACT scores between schools that are considered “exemplary” by the state of Missouri, as compared to those districts that are not. The information found in this study will help administrators determine the value that the PLC process may have on raising ACT scores.

Research questions.

RQ#1: Is there a significant difference in the composite ACT scores between schools that are recognized as “exemplary” as compared to those schools that are not recognized as exemplary?

Null hypothesis.

There is not a significant difference in the composite ACT scores between schools that are recognized as “exemplary” as compared to those schools that are not recognized as exemplary.

Anticipated benefits of the study.

The result of this study will inform school administrators of the effects that the PLC process has on ACT scores. The results of this study may influence administrators to pursue professional development by implementing the PLC process, or through other means.

Definition of terms.

ACT- American College Testing: Established in 1959 to compete with the SAT test.
AYP- Annual Yearly Progress: Required by the No Child Left Behind Act, instituted in 2000, that requires schools to reach certain goals to achieve to show student performance yearly.

DESE- Department of Elementary and Secondary Education in the state of Missouri.

PLC-Professional Learning Communities.

PD-Professional development.

Exemplary-Award given to schools by DESE for their involvement in the PLC process.

Summary.

A study was conducted to determine if there was a significant difference in composite ACT scores of schools that are recognized as “exemplary” by the state of Missouri, as compared to those that are not. If the T-test indicates a significant difference in ACT scores between schools that are exemplary and those that are not, school districts should make efforts towards becoming “exemplary.” After the study is completed, the school can also better determine which professional development program will benefit ACT scores more.
REVIEWS OF LITERATURE

From the perspective of a teacher or administrator, the professional development that is pursued by a school district has a huge impact on the successes or failures of those students involved. The idea of pursuing a certain type of professional development has existed for years, but the rise of PLCs is a movement that came about in the late 1980s and early 1990s. PLCs began when Judith Warren Little and Milbrey McLaughlin published their reports about the “most effective schools.” The characteristics of these schools were: Shared norms and beliefs, collegial relations, collaborative cultures, reflective practice, ongoing technical inquiry regarding effective practice, professional growth, and mutual support/mutual obligation. These characteristics set the foundation for more research and findings to occur, such as those by Richard DuFour and Robert Eaker. History of PLC. (2014). In a publication titled Professional Learning Communities at Work: Best Practices for Enhancing Student Achievement, DuFour and Eaker (1998) found that schools act as a professional community when the following six characteristics are practiced: Share in the responsibility and actively seek to fulfill the mission, vision, and goals of the school, work in teams to collaborate with staff, seek out the best practices for student engagement, experiment with new and different teaching ideas, participate in the school’s efforts to increase student learning, and continually focus on results.

The work of Little, McLaughlin, DuFour, Eaker, Marzano, and many others has pushed forth a movement in education in which the terms and concepts have been intercepted by school districts before they have even started the process. Michael Fullon, an expert in the area of PLCs, warned that when schools work on their own without the help of an outside agency, trying to implement the practices of PLCs would be a difficult challenge. History of PLC (2014). These beliefs show and explain why there is such a push in education today for numerous
professional development meetings and in-depth work regarding the PLC process. Proponents of PLCs have also tied in four main questions for school districts to occur when they start the PLC process. These questions are the framework for PLCs and should be answered by teachers as they reflect and plan ahead for future lessons. These questions are:  

1. What is it we expect students to learn?  
2. How will we know what they have learned?  
3. How will we respond when they don’t learn?  
4. How will we respond when they already know it?  

As PLCs continue to grow and encompass more school districts across the nation, much thought is given on how to answer those four questions. Through the PLC process, proponents attempt to answer those questions and provide guidance to teachers as they set out to improve student engagement and success.

So why is there a big push in education for school districts to raise test scores, such as the ACT? Why are schools across the state of Missouri, and the nation, pressured to give so much attention to standardized tests in general? Part of the reason is because educators want their students to receive the best education possible. As tests standardized test scores are calculated and reported to the Missouri Department of Elementary and Secondary Education (DESE), schools examine those results and compare themselves to other schools to see how they ranked. As part of staff improvement, administrators can examine deficiencies to see what areas need to be addressed, and how to develop their staff and students to meet those needs. “Raising test scores is a goal at the top of all principals' lists. It's a task that requires focus and a multi-pronged approach.” (2014, p. 1).

Another reason for the big push in education for schools raising their test scores is because it is tied in with funding and accreditation. In the school districts across the nation, a tool used by the Department of Education in determining the grade of a school is called
Adequate Yearly Progress, or AYP. AYP is part of President Bush’s education policy called No Child Left Behind. Part of AYP is the involvement of standardized tests, such as the ACT. Since the legislation has been enacted, schools have sought to increase their AYP scores. If a school district failed to meet AYP for two years in a row, they were subject to creating school improvement plans, using funds to transport students to different school districts that did meet AYP, use funds for extensive professional development, and possibly even have the state agency take over and run their school district. (Education Week Research Center, 2014)

“Since the passage of the No Child Left Behind act, the movement toward education reform has been put into high gear. Administrators all over the country are looking for ways to improve their test scores and school ranks.” (Professional Learning Communities, 2007 p. 1)

As concerns have arose over test scores, school leaders have examined which professional development they want their staff to pursue, such as PLCs. However, the issue regarding the implementation of PLCs is somewhat controversial. Some educators believe that the PLC process is worthwhile as a whole, while others question its effectiveness on student achievement. Those who believe that it is worthwhile provide several reasons for backing their views.

First, proponents state that PLCs create a collaborative culture within a school district. That breaking down the traditional roles of each teacher focusing only on their subject area opens up lines of communication and collaboration that did not exist, or were not focused on in the past. Creating teams is a large part of the PLC process, whether they are determined by subject or grade area. These teams are where the majority of the decisions are made in implementing PLCs. It is very important that these teams are given time to meet regularly. These teams share in the decision-making process and feel open to discussing their views and
opinions without repercussions from others on the team, or the administration. The teams have one overall mission and vision that is established by everyone involved with the school district. The work of the teams involved in a PLC at a school view the mission and vision as integral to the success of students. Everything they do goes back to the school’s mission and vision, as well as the four corollary questions that was stated earlier. PLCs can be defined as:

An ongoing process in which educators work collaboratively in recurring cycles of collective inquiry and action research to achieve better results for the students they serve. Professional learning communities operate under the assumption that the key to improved learning for students is continuous job-embedded learning for educators. (About PLCs, 2014, p. 1)

A key phrase in that statement is “job-embedded learning” which means that a significant aspect to implementing PLCs involves a lot of time devoted to professional development. As teachers continue to work together with their teams, develop goals and norms throughout the school year, they will also discuss other aspects, such as curriculum and assessments. (About PLCs, 2014, p. 1)

Another aspect of a PLC is continuously improving the abilities of the students and staff. An assumption is made that if students are to continually improve and learn, there should also be expectations in place for staff to continually improve as well (About PLCs, 2014, p. 1).

One of the criticisms of PLCs is also a need according to proponents that wish for the implementation of PLCs to occur. According to Linda Nathan (2008) in Teachers Talking Together: The Power of Professional Community, “A professional learning community exists when the entire faculty and staff, including the administration, work
together towards a shared set of standards and assessments that are known to everyone, including the students” (p. 1)

Nathan (2008) also points out that PLCs embody a certain element of risk, but the culture and environment should also cultivate a sense of trust among staff. There are situations in a PLC where teachers could even disagree, but the overall goal is meant to foster continuous improvement. Also, some may view a PLC as another educational program that may come and go, but advocates of PLCs believe that a PLC involves much more than just that of a program. Since PLCs are so focused on continually improving, it builds upon the success from previous years, rather than involve a one-time meeting that never gets brought up again in a staff meeting ever again. Proponents of PLCs offer all of these reasons as aspects as to why they chose to implement the professional development into their school district. The focus on learning, continuous improvement, collaborative culture, results-driven decisions, and data analysis are all ways in which arguments can be made to implement PLCs. But what are the criticisms of PLCs? If there have been years of research and efforts made towards advocating and developing PLCs, why do PLCs continue to have criticism among educators and school patrons across the nation?

One of the first obstacles that proponents of PLCs have to defend, is a negative perception that some educators may have about the professional development in general. When administrators or other individuals that believe in the program want to implement a PLC, they may have troubles due to these perceptions. Are the concerns and perceptions legit, or have they stemmed from a past experience in which a school district tried to implement a PLC, but did not do it in the appropriate way, bringing about the negative views? In his doctoral thesis, Nicholas
Bretz (2012) stated that time is a huge drawback to implementing a PLC, especially when meetings times restrict the planning times of teachers. Bretz researched focus groups to determine if there was enough evidence to prove that teachers who used their plan time for professional learning communities had impacts on student success. Bretz collected data from B.M.C. Durfee High School between 2011 and 2012. What was important to this study was the use of the perceptions of teachers and administrators of the advantages and disadvantages. Staff perception mixed with strains for time, could have a negative impact on the ability to increase student achievement.

In an article titled *Critical Reflections on Professional Learning Communities in Alberta*, Joseph Tarnoczi (2006) set out to show that professional learning communities negatively influenced teachers and their students and overall placed the responsibility of students on individual teachers. Tarnoczi incorporates different types of data into his research, such as; labor studies, sociology, and organizational management. He concluded that PLCs could eventually be beneficial to students and staff, but more efforts were needed in areas such as scheduling, and allowing individuals such as counselors and administrators to take more active roles in team meetings.

In *Five Dysfunctions of a Professional Learning Community*, Steven Weber describes five aspects that could prove difficult for administrators and teachers. Weber points out that when evaluating the effectiveness of PLCs on ACT test scores, individuals need to account for certain dysfunctions that could be evident in school districts (2009, p. 1). Labeling a school as one that is involved in the PLC process, but is actually dysfunctional would be an unfair assertion to make. These dysfunctions are hard to measure, but they need to be taken into account when comparing the effect of PLCs on ACT scores. The author mentions several of
these dysfunctions as a lack of trust, a lack of team goals, and a lack of norms (Weber, 2009).

To account for dysfunctions in this study, exemplary schools were used instead of schools that were known to be involved with the PLC process only. It is possible that schools could be involved with the PLC process early on, and may have some characteristics of a PLC district, but have other dysfunctions that could negatively influence their ACT scores.

According to Brett Muirhead’s (2009) article *Professional Learning Communities*, “Schools can claim having professional learning communities but fail to sustain a culture where knowledge sharing is a reality” (p. 1)

Muirhead (2009) makes comparisons between principals, technology, and student engagement. Muirhead points out that training in technology will improve teacher’s skills. However, if opportunities for professional development are not prevalent in their respective school districts, integrating technology will hinder student learning. Muirhead also points out that school based efforts are not effective, showing that more is needed for guidelines to success. Involved in that success are PLC efforts, involving trust and a support system for teachers. So for PLC efforts to be successful, the implementation needs to be made completely, not just incorporate certain elements of it. There also needs to be elements of trust and communication between administrators and teachers for true collaboration to occur.
RESEARCH METHODS

Research design.

A quantitative study using the t-test was conducted to see if there was a gap in achievement on the ACT scores based on which if schools were considered “exemplary” or not. The independent variable being tested was type of school, while the dependent variable ACT scores. If the difference is found significant in scores based on exemplary versus non-exemplary, school districts should be informed and implement the PLC process to best increase student learning.

Study group description.

Similar selected school districts in the state of Missouri who have reported the ACT test scores from 2011 to 2013 and were honored as exemplary, or not, were chosen as the groups evaluated.

Data collection and instrumentation.

Archived data from DESE was collected to identify raw scores of exemplary or non-exemplary on the ACT test scores from the 2011-2014 years.

Statistical analysis methods.

A t-test was conducted to find if there is a significant difference in ACT test scores based on if a school was involved with the PLC process. The source was broken into two categories: exemplary and non-exemplary. The mean, mean D, t-test, df, and p-value were concluded from this test. The Alpha level was set at 0.25 to test the null hypothesis: There is not a significant difference in the composite ACT scores between schools that are recognized as “exemplary” as compared to those that are not.
FINDINGS

A t-test was conducted to decipher whether there was a difference in performance on the 2009 to 2013 ACT Composite test score based on scheduling differences. The following tables, graphs, and charts will depict the organized findings based on the statistical raw data found on the Missouri DESE website in 2014.

Figure 1

t-Test Analysis Results for 2011-2014 Non-Exemplary vs. Exemplary ACT scores

<table>
<thead>
<tr>
<th>Source</th>
<th>Mean</th>
<th>Mean D</th>
<th>t-Test</th>
<th>df</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exemplary</td>
<td>22.10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Exemplary</td>
<td>21.34</td>
<td>-.7787</td>
<td>-1.16676</td>
<td>7</td>
<td>.281514</td>
</tr>
</tbody>
</table>

Note: Significant when p<=0.25

The independent variable was the type of school. The independent variable was broken into 2 components: Exemplary vs. Non-Exemplary. The dependent variable was the ACT score. 8 exemplary schools were selected and compared with 8 randomly selected school districts. The mean ACT score for the exemplary group was 22.10, while the mean ACT score for the non-exemplary group was 21.34. The difference between the mean scores (Mean D) was -.7787. The t-test value was -1.16676. The degrees of freedom were 7. The null hypothesis was: There is not a significant difference in the composite ACT scores between schools that are recognized as “exemplary” as compared to those that are not. The null is not rejected because the p-value is .281514, which is greater than the alpha level of 0.25. This means that there is not a significant difference between exemplary and non-exemplary schools on ACT scores.
The mean of the “exemplary” ACT test scores in the years 2011 to 2014 was 22.10. The mean of the “non-exemplary” ACT test scores in the year 2014 was 21.34. The bar graph shows the ACT score for each school selected for the study. The graph shows the two categories of exemplary and non-exemplary, each with their respective schools ACT scores. The lowest composite ACT score the non-exemplary schools received was 20.00, as compared to the lowest of the exemplary schools was 20.60. Also, if the highest ACT score of 25 was removed from the study, the mean score between the two categories would only have a difference of .36.

All of the findings compiled answered the research question: Is there a significant difference in the composite ACT scores between schools that are recognized as “exemplary” as compared to those that are not? Figures 1-2 reported there was not a significant difference in
performance on 2011-2014 ACT scores. All schools in this student performed at decent level on the ACT, with exemplary schools scoring higher than non-exemplary schools. However, figure 2 showed that there was not a significant difference between schools recognized as “exemplary” by the State of Missouri, with those that were not recognized.
CONCLUSIONS AND RECOMMENDATIONS

The research of this study shows that students in schools that have not fully implemented the PLC process score comparatively well to those students that are involved in schools that are given awards labeling them as “exemplary.” The research findings show there is a not a significant difference in the composite ACT scores between schools that are recognized as “exemplary” as compared to those that are not. The t-test results from the 2011 to 2014 testing years indicated that the p-value was .281514, higher than the alpha level set at 0.25; therefore, the null hypothesis tested is accepted. There is not a significant difference between exemplary and non-exemplary schools on the ACT exam.

The conceptual underpinning of the research writings of Dr. Wiseman are not significantly backed by the research found in this study of schools continuously building upon the implementation of PLCs to increase student achievement. However, Dr. Wiseman did state in his research that it was difficult to tell a difference between how involved schools were with the PLC process (2014). It is possible, that even though schools are not exemplary, they could still have elements of the PLC process in play at their school district. Since this study found that there is no significant difference in the data relating to exemplary or non-exemplary schools on ACT exams, schools should not be discouraged in their endeavors if they wished to implement and follow through with the professional development. It is also interesting to point out, that Joseph Tarnoczi pointed out in his research a claim that shows that professional learning communities actually negatively influence teachers and their students and places the responsibility of failures in education on individual teachers (2006). So even though there is research and many advocates in support of PLCs, there are also beliefs that PLCs are a hindrance in the educational spectrum for the success of students and effectiveness of staff.
After completing this study there are some other studies that could be conducted. A study could be performed to see if these trends occur in other states as well in regards to PLCs and ACT scores. Studies involving even more numbers of school districts could be used to see if the findings remain similar to what was found in this study.

Research questions could be tied in with the use of PLCs and compared to other factors instead of ACT scores. Perhaps PLCs could have a difference on teacher satisfaction levels, discipline referrals, ineligibility lists, graduation rates, and even other standardized tests, such as end-of-course exams.

Administrators need to examine what professional development works best for their school districts and staff to pursue. The need to examine what programs will best meet the needs of their students. School districts need to look at the benefits and drawbacks of whatever professional development they choose to pursue. If students are involved with schools that have professional learning communities in place and are not seeing positive results at the next level, then the push for PLCs should be assessed, or more efforts need to be addressed to focus on how to prepare students for the next level. Teachers should also be considered to give their input as to how to make the school even better. The results of this research does not state that PLCs are bad, only that there is not a significant difference on ACT results.
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