Providing Teacher Candidates Experience in Data Teams: Analyzing Literacy Data

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Preparing teacher candidates to analyze achievement data is necessary to develop the understanding of how academic data is collected and used to inform instruction. Collecting achievement data in the area of literacy includes a variety of assessments focused on reading and writing. A critical component of analyzing data involves working in collaborative data teams. This article describes the process of providing teacher candidates opportunities to analyze data in collaborative partnerships, giving them experience with using data teams to make informed instructional decisions.

Introduction

Within the walls of the classrooms, teachers have a responsibility to not only provide instruction connected to the standards outlined by the district, but they also have responsibility for using the data they collect. The data teachers collect for literacy alone includes assessments such as reading comprehension, writing, and fluency. "Interpreting data allows teachers to identify the strengths and weaknesses of an entire class as well as individual students" (NAESP, 2011, p.3). A critical component of analyzing data is collaboration among teachers. When teachers engage in collaboration that they see as useful and helpful, there is both an individual and collective benefit. (David, 2008/2009; Killion, 2015). Grade-level teams of teachers who created student assessment portfolios not only developed a deeper understanding of how to assess student learning but also used those results to guide their instruction (Gearheart & Osmundson, 2008). Working in data teams and mining through the data can allow for support and suggestions to be shared helping meet the needs of the students they serve.

Professors of teacher education programs have the responsibility to prepare teacher candidates (TCs) to enter their first year of teaching not only with a strong understanding connected to designing lessons and implementing lessons for the literacy block, but also assist them in developing background knowledge in what it means to analyze achievement data in literacy. Mandinach and Jimerson (2016 stated, "Learning about the ways in which data inform instructional planning, delivery, and intervention efforts when educators are already in practice is too late" (p. 1). Data based decision making is becoming increasingly important in education (Mandinach & Gummer, 2013). Therefore, teacher education programs need to prepare TCs to collect the data, then analyze and interpret scores for the purpose of making informed instructional decisions.

Preparing the Teacher Candidates for Data Teams

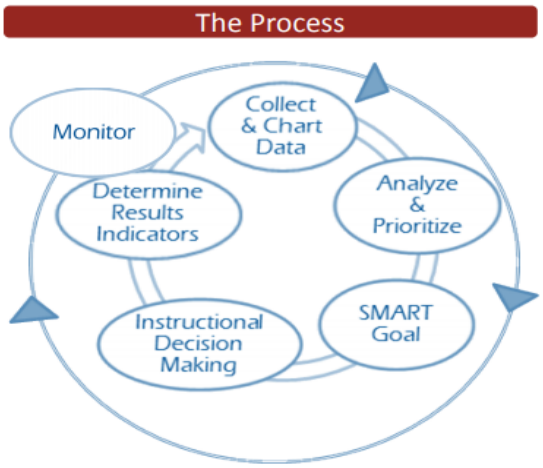
At the University of Central Missouri, first semester senior teacher candidates (TCs) in the communication arts integration course engaged in data teams by analyzing

and making informed instructional decisions from a mock data set. Additionally, TCs were given reflection questions before working in data teams and after working in data teams to gather their insights on analyzing student achievement data. There were two questions asked before the course activities began: (1) What do you know about analyzing student achievement data? (2) What do you hope to learn? There were four questions given after the course activities: (1) What do you know about analyzing achievement data? (2) How have the course activities and assignments prepared you to analyze achievement data for your future classroom? (3) How will you use what you have learned about analyzing student data when you have your future classroom? (4) What questions do you still have about analyzing achievement data? TCs had the opportunity to opt in or out of the short answer prompts for the purpose of this action research.

Before the TCs were released to work on the data set, preparing them required instruction on the data cycle, connecting to Professional Learning Communities (PLCs), and background on Response to Intervention. It was emphasized that PLCs are "composed of collaborative teams whose members work interdependently to achieve common goals for which members are mutually accountable" (DuFour, DuFour, Eaker, and Many, 2010, p. 11). Additionally, the TCs were given the four guiding questions for PLCS: "1) What do we want all students to learn? 2) How will we know if each student has earned it? 3) How will we respond when students do not learn it? 4) How can we extend and enrich the learning for students who have demonstrated proficiency" (DuFour et al., p. 119). Discussion around the four questions took place along with discussing the data cycle using resources from Missouri Educational Systems and Instruction for Learning (MO Edu-Sail) described in Figure 1.

Figure 1

Missouri Educational Systems and Instruction for Learning



During course instruction, the TCs were familiar with data teams based on observing grade level collaboration meetings during their practicum experience during the semester. However, they were missing one piece, which was the opportunity to analyze a class set of data. The TCs can listen and engage in conversations about what data teams look like and make connections to PLCS, but when the opportunity is given to examine a data set, they can begin to synthesize what they learned and apply it to their future classroom.

Teacher Candidates Engaged in Data Teams

The TCs were given a mock data set, which included three or four data points depending on the grade level (*Table 1*). Depending on the grade level assigned, the mock data also included Developmental Reading Assessment (DRA) level, Accelerated Reader (AR) level, sight words

score, a writing score, and a Missouri Assessment Program (MAP) reading score. The pre-service teachers were given a choice on the grade level data set they wanted to analyze. During this process, the TCs were given two class periods to work on the data set in their data teams.

The third class period required them to present their data analysis presentations to the class. This opportunity provided the teacher candidates other strategies and activities they could implement in their future classrooms.

Table 1
Third Grade Mock Data Set

Student	**DRA Score Winter**	**Narrative Writing Assessment Winter**	**Accelerated Reader: Reading Level**
Lauren	34	3	3.5
Beth	38	4	4.1
Cole (Learning Disability…IEP for reading and writing)	20	1	2.3
Cameron	34	2	3.5
Shari	40+	4	4.2
Edwin	34	3	3.5
Gabriel	38	4	3.5
Harold	40	4	3.5
Jack	34	3	3.2
Katherine (Learning Disability…IEP)	24	1	2.7
Josh	Life skills student who is not tested but in room during the reading block with para		

Matthew	38	4	3.7
May	Life skills student who is not tested but in room during the reading block with para		
Louis	28	2	3.2
Yin	44	3	4.2
Benjamin	44	4	3.5
Samuel	34	3	3.5
Theresa	34	2	3.2
Mack	30	2	3.2

Findings - Before Course Activities

There were two sections of the communications arts course with twenty-five TCs per courses. Of the two courses, 38 TCs participated in short answer prompts. Two questions were given before the course activities on analyzing student data were discussed. The questions were: (1) What do you know about analyzing student achievement data? (2) What do you hope to learn? When reviewing the response to the questions, similar responses and themes emerged.

Question 1: What do you know about analyzing student achievement data?

For Question 1, 37 responses were submitted. Of those 37 responses, answers varied in limited responses to responses in detail. One TC stated she did not know about this topic while another TC stated she knew very little about how data shows what students know.

The most occurring theme for this question was the use of assessment for instructional decision-making. Some TCs wrote responses which indicated understanding of analyzing student achievement data worth noting. One TC stated, "Analyzing achievement is important. I have been in classrooms with teachers who have student data folders with colored charts with their pre-test and post test scores. It seems to have a high effective rate within students. Analyzing student data is also important when collaborating with other team members because it drives instruction." Another TC wrote, "this is a way to guide your instruction and figure out what your students need from you. You should be open with your students about their data so that they understand where they are at and can make a goal for where they would like to be."

Additionally, another response indicated a strong understanding of analyzing achievement data. "Data needs to be collected and analyzed frequently to help guide what needs to be taught and how to teach it to different students for them to be successful." Many TCs wrote limited responses, which included how data is used

to guide instruction, and how it is used to check for understanding.

TC responses were also connected to meeting the needs of the students and how the data would help them make those decisions. One TC wrote how the data helps her determine the level of her students. "I know that achievement data can give the teacher...feedback. It also shows me my end goal for the students by the end of the year. It can tell me who is at what level. So the different levels can also help me create appropriate cooperative groups." Another TC stated that data helps teachers make accommodations and modifications. "Achievement data demonstrates the low and high end of student performance. It benefits teachers by being able to determine instructional strategies that worked or didn't. And allows us to determine who needs modifications, accommodations and differentiation."

Question 2: What do you hope to learn?

The second question provided the professor an opportunity to gather TC feedback in order to ensure an understanding of the course modules on Response to Intervention and the purpose of data teaming. All 38 TCs submitted a response and several of those were connected to the theme of using data to guide instruction.

Two of the themes that emerged from the question were connected to collaboration with their grade level teams and sharing data with parents. TCs also wrote how they wanted to be able to collaborate in vertical teams. A TC shared, "I hope to learn how to collaborate with other team members to help improve student scores." Another TC stated she hoped to learn how to "better display data to members of a PLC group and parents."

Additionally, a theme that emerged from this question was helping students track data and sharing the data with the students. One TC wrote, "I hope to learn how to help my students track their own growth and data, as well as just how to be more proficient and build my confidence." Another TC wrote how she wants to be able to share the data with students in a way that is not discouraging, but "where they can see where they are and to set goals."

Providing the two question prompts before students engaged in the course modules and worked on the mock data set, provided insights in order to center the instruction on what they needed before releasing them to work collaboratively. Additionally, it provided a snapshot of any experience the TCs had with analyzing student data.

Findings - After Course Activities

After the mock data sets were presented in class, the 38 TCs were sent the follow-up reflection questions on analyzing student achievement data. The questions included: (1) What do you know about analyzing achievement data? (2) How have the course activities and assignments prepared you to analyze achievement data for your future classroom? (3) How will you use what you have learned about analyzing student data when you have your future classroom? (4) What questions do you still have about analyzing achievement data? Upon reviewing the responses from the 37 TCs, themes emerged in regards to analyzing student achievement data. The responses elaborated upon the importance of analyzing student achievement data.

Question 1: What do you know about analyzing achievement data?

When reviewing the responses for Question 1, of the 33 responses provided, a couple of themes emerged. One theme focused on using data to guide further

instruction. A TC stated, "A teacher must analyze [her] students' data to get a better understanding of where that child is in their learning. Using the data, teachers can help students by providing more instruction for that student or by challenging the students that already have a grasp on the content. Analyzing the data will help the teacher see what lessons need to be taught again, how they should teach it, and when their students achieve the goal."

Another TC stated analyzing data offers an "invaluable support" for making decisions about instruction while another wrote that she can use the data to alter instruction to meet the needs of the students. Another TC provided this statement: "Analyzing achievement data is important. Just because you taught something doesn't mean the students fully understood it. You will have to use this data to plan your next steps."

The other theme, which emerged from Question 1, was using data to set learning goals. One TC wrote, "I know that analyzing achievement data will assist with learning goals for each student," while another TC responded that analyzing data allows the teacher to determine the learning goals to meet the needs of each student.

Question 2: How have the course activities and assignments prepared you to analyze achievement data for your future classroom?

The second question focused on how the course activities have prepared the TCs for their future classroom. Thirty-four TCs provided meaningful and purposeful feedback on how the course activities have prepared them. One TC stated, "This has really helped me by giving an assessment, closely analyzing the data and finding ways to help all of my students get the learning experience that they need." Another TC honestly wrote that it helped her see the challenges that come with analyzing data. This TCs response captured how the data teams was useful for her future career. "The data analysis project was a huge help on how to use data for the classroom. I really enjoyed working on the project in groups because it was like working with my future grade level team!"

The TCs' responses provided insights for the professor on the importance of continuing assignments focused on analyzing student data. Another TC stated, "The data analysis project helped me to analyze data for my future classroom because it guided me in grouping students for instruction. It also challenged me to come up with instructional strategies and learning activities for the below-level, on-level, and above-level students."

Question 3: How will you use what you have learned about analyzing student data when you have your future classroom?

When reviewing the 34 responses submitted for Question 3, responses were focused on student centered instruction. One TC responded that she will focus her "mindset" on meeting the needs of her students to improve student success. Another TC wrote, "I will be aware that all of my students are at different levels and there is much work to be done to meet their needs. I will also use what I have learned to remember that it can take a while for the students to grow." Another response included, "I will collect and use data throughout most of my lessons. I will use a variety of ways to collect this data, too. I want to be able to look at the data and know my next steps—create groups to reteach, continue on, or challenge students more. I believe I can be a more efficient teacher and meet every student's needs."

Others responded with similar shorter responses, which connected to monitoring

the students' learning, providing next steps for students' learning, establishing learning groups, and using data to reteach lessons to ensure students meet the learning goal. One TC affirmed, "I will use what I have learned to take on my future classroom confidently. I will use what I know to collaborate with my PLC and others who understand my students and who can provide input on what I can do to best support the students in my classroom." These responses indicated the TCs' level of understanding on the importance of using data to guide instruction.

Question 4: What questions do you still have about analyzing achievement data?

The final question posed to the TCs centered around questions they still had on the topic of analyzing student achievement data. Of the 38 TCs, 23 responses were collected. Responses were limited, but three responses worth noting included:

- "What do I do if I keep trying to analyze data and base future lessons off of the information I gained but the data is not improving after trying several different strategies?"
- "How do you communicate the results to students?"
- "In my first few years of teaching, will I receive any training on analyzing achievement data within the school district I am in?"

Though responses were limited, these three questions provided future discussion points to address when preparing TCs for analyzing student data.

Discussion

Through the course modules connected to analyzing achievement, along with analyzing the mock data set in data teams, it was evident that this was beneficial to the TCs' learning. The TCs' responses provided a snapshot of how the activities supplied the tools they need to enter their student teaching semester and first year of teaching with not only a strong understanding of what it means to analyze data, but also the opportunity to work on analyzing a class data set connected to reading and writing. These activities provided them a hands-on opportunity to work on analyzing a class data set connected to reading and writing. The three questions from TCs in response to Question 4 were also valuable because these are additional areas to include when covering analyzing literacy data with future TCs. Embedding a course module on communicating achievement scores with students will be beneficial when discussing student portfolios and goal setting. Additionally, discussing additional strategies and interventions for those students who do not meet the goal is also important to add to the course module on analyzing literacy data.

Conclusion

The faculty in teacher education programs have a responsibility to prepare TCs to enter their first year of teaching with the tools to be successful when it comes to analyzing achievement data in literacy. Teaching reading and writing is complex. Therefore, being able to take literacy achievement scores and develop an action plan for meeting the needs of the students is imperative. Teachers need to know how to use a variety of assessment data from once-a-year state testing, district assessments, and the ongoing assessments both formatively and summatively (Council of Chief State School Officers, 2013). Providing opportunities in the courses using mock data sets from a variety of assessments is time well spent to prepare the TCs. Additionally, the feedback from the TCs opened the door for other considerations when it comes to

analyzing data to make informed decisions. Other opportunities include TCs administering assessments, such as reading comprehension assessments in their practicum. They can take those assessments and work collaboratively with their cooperating teacher to analyze the results and develop an action plan for instruction. David (2008/2009) shared, "When teachers collaborate to pose and answer questions informed by data from their own students, their knowledge grows and their practice changes" (Para. 5). Providing TCs these experiences in the teacher education program will be of benefit when they enter their first year of teaching. TCs can be confident they have the necessary tools needed to collaborate in grade-level teams with literacy data to make informed instructional decisions, helping students grow academically through the year.

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