



Collaborative Inquiry Teams

Teachers are often inundated with student assessment data that may or may not be utilized for creating lasting improvements in teaching and learning. One solution to this problem is supporting teachers in data interpretation along with a focus on how the interpretation of data transfers to a change in teaching practice. Even though data interpretation will support changes in teacher instruction, teachers may find this work difficult (Sun, Przybylski, & Johnson, 2016). The skills needed are addressed in the collaborative inquiry process.

Collaborative inquiry is “a team of skilled educators working together to implement a coherent instructional plan to identify the learning needs of every student and to meet those needs” (Boudett, City, & Murnane, 2018, p. 2). The Data Wise improvement process is the overarching process that encompasses collaborative inquiry teams. The Data Wise process (Boudett, City, & Murnane, 2018) builds educator skills in data analysis and ways of using the data effectively to change instruction to meet student needs. This process includes three phases: Prepare, Inquiry, and Act. In the Prepare phase, teachers organize for collaborative work, build assessment knowledge, and create a data overview. In the Inquiry phase, teachers dig into student data and examine instruction. In the Act phase, teachers develop an action plan. This plan includes a plan to assess progress, then act (new instructional practice) and assess student learning. The Collaborative Inquiry process is recursive, returning time and again to the Inquiry and Act phase as teachers implement action plans, assess results, and build the next action plan based on student needs. In some settings, professional development focused on data use has been shown to be effective at increasing student achievement (Lai & McNaghton, 2016). Thus, a focus on professional development that creates highly skilled collaborative inquiry teams benefits students’ ongoing learning needs and supports teachers as they adjust their instructional practices to meet those needs.

Local School (LS, a pseudonym) is a charter school and serves a Kindergarten – eighth-grade student population in the Northeastern Nevada region. The LS principal requested Northeastern Nevada Regional Professional Development Program (NNRPDP) support for improving student learning outcomes through the use of the Data Wise process, specifically, Collaborative Inquiry Teams. The outcome of this learning opportunity for LS teachers is as follows:

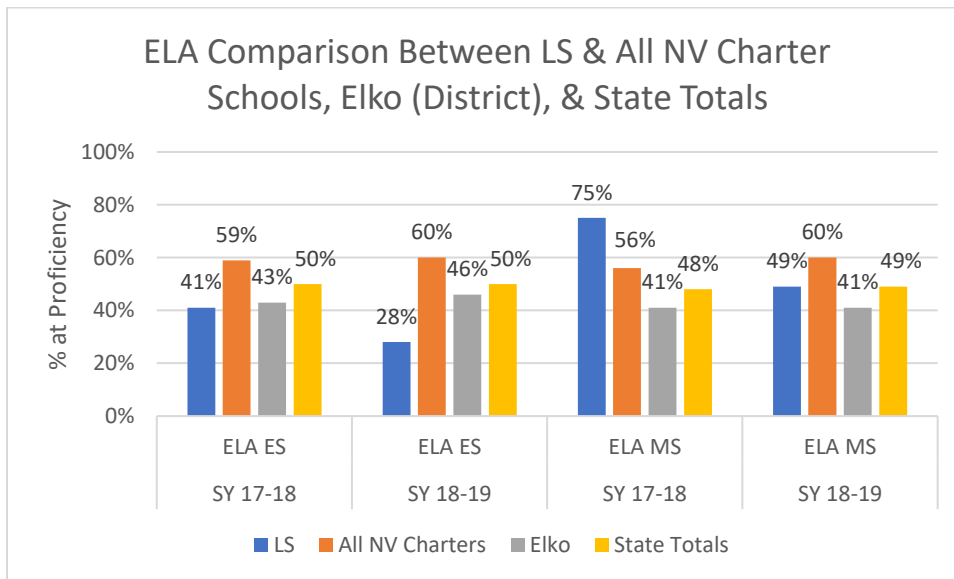
Teachers who have completed Collaborative Inquiry Team professional learning will demonstrate the ability to choose and implement new teaching strategies targeted to areas of need identified by multiple assessments.

Initial Data and Planning

The professional development priority established by the LS principal was increased achievement in both English Language Arts and Math. This priority was based on the Nevada Report Card ratings drop from their 2017-2018 three-star rating to the 2018-2019 two-star rating (Nevada Department of Education, n.d.) and the corresponding drop in proficiency from 2017-2018 to 2018-2019. Figure 33 and 34 provides a comparison between LS charter and all Nevada charter school proficiencies during that time. As noted in the figure, LS proficiency declined in this time period with the exception of middle school math (which made a roughly 1% increase), while all Nevada charter schools either maintained their proficiency levels or slightly increased. This information provided the data to the LS principal that initiated the request for service with the NRRPDP.

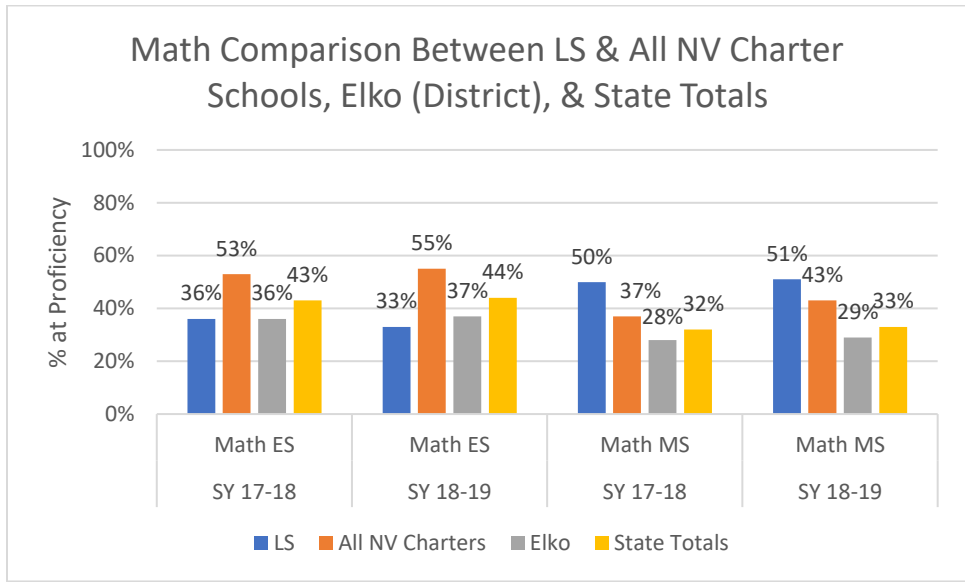
The comparison between LS ELA scores in both elementary and middle schools compared to all Nevada charter schools is displayed in Figure 33.

Figure 1 Comparison of ELA Scores Between LS and All NV Charter Schools



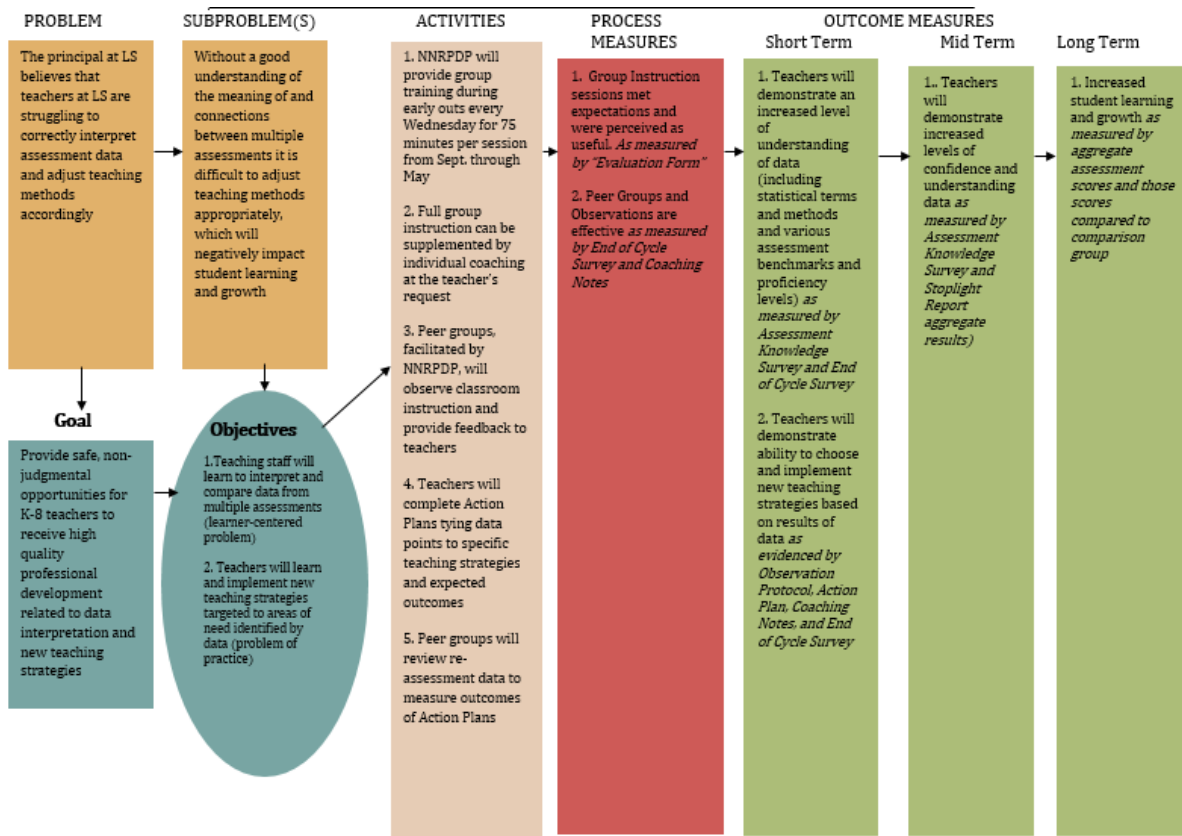
The comparison between LS math scores in both elementary and middle schools compared to all Nevada charter schools is displayed in Figure 34. These data indicated that LS students were not achieving proficiency at the same rate as other charter schools. The LS principal believes this is due to lower levels of teachers' knowledge of and ability to interpret data and adjust instruction accordingly.

Figure 2 Comparison of Math Scores Between LS and All NV Charter Schools



LS has a dedicated professional learning time every Wednesday (early out for students) which was utilized for implementation of the Collaborative Inquiry Teams. Current teacher content knowledge of assessment terms and analysis skills were intended to be assessed using a questionnaire administered in the fall (pre-assessment), in February (mid-year assessment), and spring (post-assessment). Because this project was cut short due to the COVID-19 global pandemic, only the pre-assessment and mid-year assessments were administered. LS teacher assessment knowledge strengths included basic terminology knowledge and correctly identifying scores and levels on Smarter Balanced Assessment Consortium (SBAC) charts. These strengths formed a foundation on which to build a greater understanding of student assessments and analysis. LS teacher assessment knowledge current learning needs included advanced assessment terminology knowledge and amelioration of several misconceptions about student proficiency, adequate student growth, interpretation and analysis of writing samples, and identification of independent reading levels. Professional Learning (PL) was designed to address these needs and go beyond the analysis of student data and support teachers in changing instructional strategies through implementation of Collaborative Inquiry Teams. A logic model (see Figure 35) was created to illustrate shared relationships between the program’s activities and its intended effects.

Figure 3 NNRPDP Collaborative Inquiry Teams-Logic Model



Roles and Actions

Two knowledgeable and experienced NNRPDP coordinators were chosen to lead the work. Both coordinators have extensive experience in assessment analysis and interpretation, and are familiar with the state and school level assessments. Both coordinators are also well versed in best pedagogical practices as delineated in the Nevada Educator Performance Standards (NEPF) and have facilitated teachers in implementation of the NEPF. Additionally, both coordinators have coaching training, skills, and experience in coaching teachers one-to-one, in teams, and in whole-group settings. This combined experience brought a high level of expertise to the implementation of the Collaborative Inquiry Teams.

To accomplish the goals of this project, the coordinators designed the pacing of the learning for the teachers, incorporating weekly early out sessions and the approximately monthly full or half-day sessions. LS provided the necessary resources needed for the project, namely, the time during the early out sessions each week. The teaching staff was enthusiastic about the learning opportunity and open to the prospect of instructional change. The process of collaborative inquiry fits into existing school efforts. The process takes advantage of data analysis, careful examination of evidence, peer collaboration, planning, and implementation of new teaching strategies. This framework is compatible with any existing school-level initiative,

and can be sustained over time as teachers refine their newly acquired skills. Specific roles and actions are outlined in Table 25.

Table 1 *Roles and Actions*

NNRPDP Coordinators	Teachers	Administrator
<ul style="list-style-type: none"> ● Provide group training during early outs every Wednesday for 75 minutes per session from Sept. through June ● Full group instruction can be supplemented by individual coaching at the teacher’s request ● Peer groups, facilitated by NNRPDP, will observe classroom instruction and provide feedback to teachers ● Teachers, facilitated by NNRPDP, will complete Action Plans tying data points to specific teaching strategies and expected outcomes ● Peer groups, facilitated by NNRPD, will review reassessment data to measure outcomes of Action Plans 	<ul style="list-style-type: none"> ● Teachers will complete Action Plans tying data points to specific teaching strategies and expected outcomes ● Peer groups will review reassessment data to measure outcomes of Action Plans 	<ul style="list-style-type: none"> ● Provide time during the workday for professional learning (Wednesday early out). ● Meet with teachers individually (weekly) to provide support in the Collaborative Inquiry work as needed.

Method

Learning Design

Effective professional learning is that which “results in changes to teacher knowledge and practices, and improvements in student learning outcomes” (Darling-Hammond, Hyler, & Gardner, 2017). The intervention was designed with that in mind. The learning design included key components from the Data Wise (Boudett, City, & Murnane, 2018) project at the Harvard Graduate School of Education. The Data Wise process is a series of recursive steps designed to help teachers analyze and interpret data, work collaboratively to design an action plan (change instructional strategies), plan how to assess progress, and then act on the plan (followed by assessment). This process is action research, which leads to the “empowerment of teachers, collaboration through participation, acquisition of knowledge, and improvement in instructional practices” (Murray, 2014), which, ultimately, could increase student outcomes. Indeed, Amels, Kruger, Suhre, and van Veen (2019) found that “inquiry-based working strongly appears to predict teachers’ capacity to change” (p. 371). While it’s clear that collaboration and inquiry can lead to changes in instructional practice for teachers, adapting and incorporating change can remain difficult (Butler & Schnellert, 2012). For this reason, the intervention incorporated effective elements as outlined by Darling-Hammond, Hyler, and Gardner (2017) including content focus, active learning, collaboration, use of models and modeling, coaching and expert support, feedback and reflection, and sustained duration. The intervention pacing and each session were planned with these elements in evidence. The intervention also aligns with Nevada’s Standards for Professional Learning as shown in Table 26.

Table 2 *NNRPDP Collaborative Inquiry Teams Aligned with the Standards for Professional Learning*

Standard	Alignment
LEARNING COMMUNITIES: Professional learning that increases educator effectiveness and results for all students occurs within learning communities committed to continuous improvement, collective responsibility, and goal alignment.	A learning community will be formed with the staff (one per grade band level K-8) for one large group of roughly 12-15 and smaller groups of both grade bands and heterogeneous groups. Weekly professional learning will provide a forum for this community. The learning community participants will follow the Data Wise Improvement process through the implementation of Collaborative Inquiry Teams. In this community, learners will explore data analysis, examine problems of practice, develop action plans, assess progress, adjust action plans

Standard	Alignment
	including new instructional strategies, and reflect on personal practice and implementation.
<p>LEADERSHIP: Professional learning that increases educator effectiveness and results for all students requires skillful leaders who develop capacity, advocate, and create support systems for professional learning.</p>	<p>The PLP is designed to develop capacity in all participants and support systems for ongoing professional learning.</p>
<p>RESOURCES: Professional learning that increases educator effectiveness and results for all students requires prioritizing, monitoring, and coordinating resources for educator learning.</p>	<p>Human resources include two NNRPDP coordinators, as well as the teaching staff at LS willing to commit to weekly professional learning meetings, implementation of the Data Wise Improvement Process and Collaborative Inquiry Teams, and coaching.</p>
<p>DATA: Professional learning that increases educator effectiveness and results for all students uses a variety of sources and types of student, educator, and system data to plan, assess, and evaluate professional learning.</p>	<p>Short term measures:</p> <ol style="list-style-type: none"> 1. Teachers will demonstrate an increased level of understanding of data (including statistical terms and methods and various assessment benchmarks and proficiency levels) as measured by the Assessment Knowledge Questionnaire and End of Cycle Survey 2. Teachers will demonstrate the ability to choose and implement new teaching strategies based on the results of data as evidenced by Observation Protocol, Action Plan, Coaching Notes, and End of Cycle Survey <p>Midterm measures:</p> <ol style="list-style-type: none"> 1. Teachers will demonstrate increased levels of confidence and understanding data as measured by Assessment Knowledge Questionnaire (and the Stoplight Report aggregate results) <p>Long term measures:</p>

Standard	Alignment
	1. Increased student learning and growth as measured by aggregate assessment scores and those scores compared to comparison group
<p>LEARNING DESIGNS: Professional learning that increases educator effectiveness and results for all students integrates theories, research, and models of human learning to achieve its intended outcomes.</p>	<p>Guskey’s Five Levels of Professional Development and the Standards for Professional Learning are the basis for this professional learning. The learning includes opportunities to identify personal and professional relevancy through reflection, inquiry, practical engagement, collaboration, interconnection, integration, and application of concepts.</p>
<p>IMPLEMENTATION: Professional learning that increases educator effectiveness and results for all students; applies research on change and sustains support for implementation of professional learning for long-term change.</p>	<p>Participants are provided with tools to support their efforts in making essential instructional shifts required to successfully implement Collaborative Inquiry Teams through the use of the Data Wise Improvement Process. Continued support of outcomes will be made available to all stakeholders upon request.</p>
<p>OUTCOMES: Professional learning that increases educator effectiveness and results for all students aligns its outcomes with educator performance and student curriculum standards.</p>	<p>NNRPDP coordinators encouraged similar Collaborative Inquiry Team experiences across grade levels and content areas in order to ensure that teachers throughout LS received support. This in turn led to students consistently receiving high-quality instruction</p>
<p>EQUITY: Professional learning that increases educator effectiveness and results for all students focuses on equitable access, opportunities, and outcomes with an emphasis on addressing achievement and opportunity disparities between student groups.</p>	<p>NNRPDP coordinators facilitated discussions and focused on ways to ensure that the Collaborative Inquiry Team support would be available to all teachers within the school and that all students would benefit from effective instruction.</p>
<p>CULTURAL COMPETENCY: Professional learning that increases educator effectiveness and results for all students facilitates educator’s self-</p>	<p>NNRPDP coordinators facilitated discussions with the LS teachers giving opportunities for self-examination and promoting a greater awareness of</p>

Standard	Alignment
examination of their awareness, knowledge, skills, and actions that pertain to culture and how they can develop culturally-responsive strategies to enrich educational experiences for all students.	cultural norms and biases and the role they play in teaching and learning.

Participants and Procedure

The Data Wise process and Collaborative Inquiry Team professional learning occurred during the 2019-2020 school year. Two NNRPDP facilitators met with the entire staff of LS K-8 school each Wednesday early-out for 75 minutes. Fourteen total participants included ten classroom teachers (grades K-8, including two long-term substitutes), one special education teacher, one literacy specialist, one paraprofessional, and one administrator. Three full-day and two half-day training sessions were planned over the course of the year, roughly one per month. Prior to the COVID-19 school shut down, two full-day and one half-day training sessions were completed (see Appendix O) for full schedule and calendar).

Measurement

The objectives of this intervention were 1) teaching staff will learn to interpret and compare data from multiple assessments (learner-centered problem) and 2) teachers will learn and implement new teaching strategies targeted to areas of need identified by data (problem of practice). These objectives were measured using a variety of methods aligned with Guskey’s (2002) five levels of professional development indicated in Table 27.

Table 3 *Five levels of Professional Development Evaluation (Guskey, 2002)*

Evaluation Level	Questions Addressed	How Will Information be Gathered?	What is Measured or Assessed?	How Will Information Be Used?
1. Participants’ Reactions	Did this training meet my expectations? Did the presenter’s expertise and	<i>NNRPDP Evaluation Form (bi-monthly), Weekly Reflection Response</i>	<i>Participants’ initial satisfaction with the experience and perceived benefit</i>	To improve program design and delivery

Evaluation Level	Questions Addressed	How Will Information be Gathered?	What is Measured or Assessed?	How Will Information Be Used?
	<p>experience impact the learning?</p> <p>What did I learn from the analysis process today?</p>			
2. Participants' Learning	Did participants acquire the intended knowledge and skills?	<p><i>NNRPDP Evaluation Form (bi-monthly),</i></p> <p><i>Spotlight Report (pre and post)</i></p> <p><i>Weekly Reflection Response,</i></p> <p><i>Knowledge Questionnaire,</i></p> <p><i>Coaching Notes</i></p>	<p><i>Participant understanding of data, including statistical terms and methods and various assessment benchmarks and proficiency levels</i></p>	To improve program content, format, and organization
3. Organization Support and Change	<p>Was implementation advocated, facilitated, and supported?</p> <p>Was the support public and overt?</p> <p>Were problems addressed quickly and efficiently?</p> <p>Were sufficient resources made available?</p>	<p><i>NNRPDP Evaluation Form (bi-monthly),</i></p> <p><i>Weekly Reflection Response,</i></p> <p><i>Coaching Notes</i></p>	<p><i>The organization's advocacy, support, accommodation, facilitation, and recognition</i></p>	To document and improve organization support and to inform future change efforts

Evaluation Level	Questions Addressed	How Will Information be Gathered?	What is Measured or Assessed?	How Will Information Be Used?
	<p>Were successes recognized and shared?</p> <p>What was the impact on the organization's climate and procedures?</p>			
4. Participants' Use of New Knowledge and Skills	Did participants effectively apply the new knowledge and skills?	<i>NNRPDP Evaluation Form (bi-monthly),</i> <i>Weekly Reflection Response,</i> <i>Assessment Knowledge Questionnaire,</i> <i>Coaching Notes</i>	<i>Teachers' ability to analyze student data, create an action plan, act according to the action plan, reassess student learning, and repeat</i>	To document and improve the implementation of program content
5. Student Learning Outcomes	<p>What was the impact on students?</p> <p>Did it affect student performance or achievement?</p>	<i>MAP growth data collected in the fall and winter compared to MAP growth data from previous year.</i>	<i>Student growth</i>	<p>To focus and improve all aspects of program design, implementation, and follow-up</p> <p>To demonstrate the overall impact of professional learning</p>

Note. Italicized text is specific to this intervention.

Spotlight Report

First, teachers were asked to complete a Spotlight Report indicating the current extent of each step of the Data Wise process (not at all, somewhat, consistently) corresponding to

Guskey's (2002) level 2 (participants' learning). This measure was intended to be administered both pre and post intervention, however, due to the unexpected school closures (COVID-19), the post intervention Spotlight Report response was collected in May, but the intervention work ceased in mid-March.

NNRPDP Evaluation

Teachers completed the NNRPDP Evaluation bi-monthly (Appendix B). The NNRPDP Evaluation pertains to Guskey's level 1 (participants' reactions), level 2 (participants' learning), level 3 (organization support and change), and level 4 (participants' use of new knowledge and skills).

Weekly Reflection Response

Initially, an End of Cycle Survey was planned, however it proved too cumbersome to complete on a weekly basis. An abbreviated Weekly Reflection Response was substituted which corresponds to Guskey levels 1 - 4.

Assessment Knowledge Questionnaire

The Assessment Knowledge Questionnaire (see Appendix I) was intended to be administered in the fall (pre-assessment), in February (mid-year assessment), and spring (post-assessment), meeting Guskey's evaluation levels 2 (participants' learning) and 4 (participants' use of new knowledge and skills). For the reason noted above, only the pre-assessment and mid-year questionnaires were administered.

Coaching

Three of the eight classroom teachers and one of the two long-term substitutes requested personalized literacy coaching, meeting Guskey's evaluation levels 2 (participants' learning), 3 (organization support and change), and 4 (participants' use of new knowledge and skills). While this coaching was not solely focused on data interpretation for the collaborative inquiry team process, the coordinator noted occurrences of data interpretation and analysis as well as implementation of instructional change. The four teachers requesting coaching are 31% percent of the classroom teaching staff, excluding the principal. This is a large portion of a whole staff to request coaching. This exemplifies the commitment and intensity of the LS teachers and principal to the intervention. Coaching occurred during one of the teacher's prep times every other week, which means that the coached teachers had to give up a planning session that week.

As noted above, the primary focus of this coaching was literacy, and when the topics of data interpretation or instructional changes occurred, they were tracked by the coordinator.

Peer groups met to create action plans, tying data points to specific teaching strategies and expected outcomes. In consultation with the principal, it was deemed wise to delay the observation of peers while teachers focused on data interpretation/analysis and designing action plans with the hope of initiating peer observation in the spring. As noted above, the COVID-19 shutdown of Nevada schools in March prevented full implementation of peer observation for the 2019-2020 school year.

Measure of Academic Progress (MAP)

Measurement of overall student achievement using MAP results (fall and winter growth projection 2019-2020) meet Guskey’s level 5 (student learning outcomes).

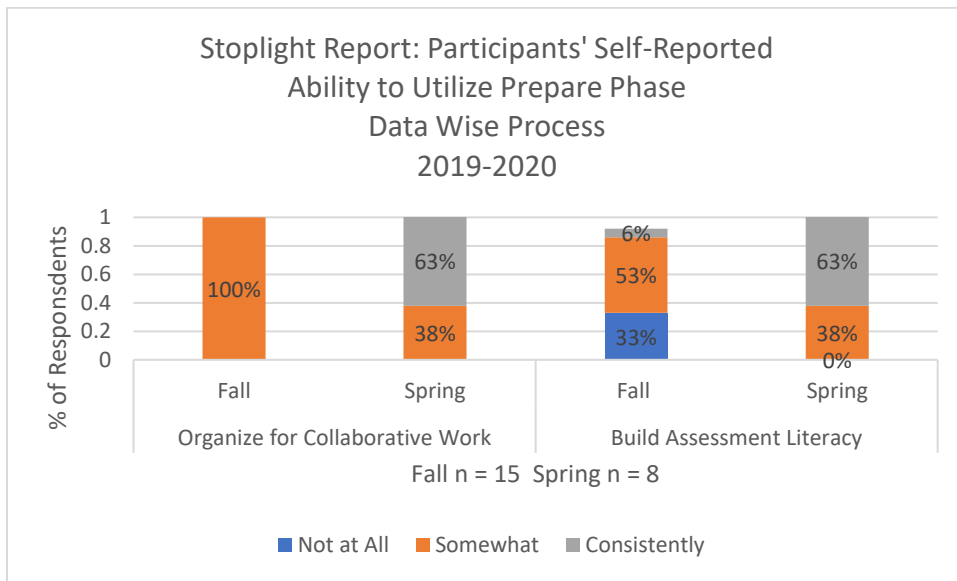
Results

No analysis for statistical significance or correlations were performed due to the small number of responses.

Spotlight Reports

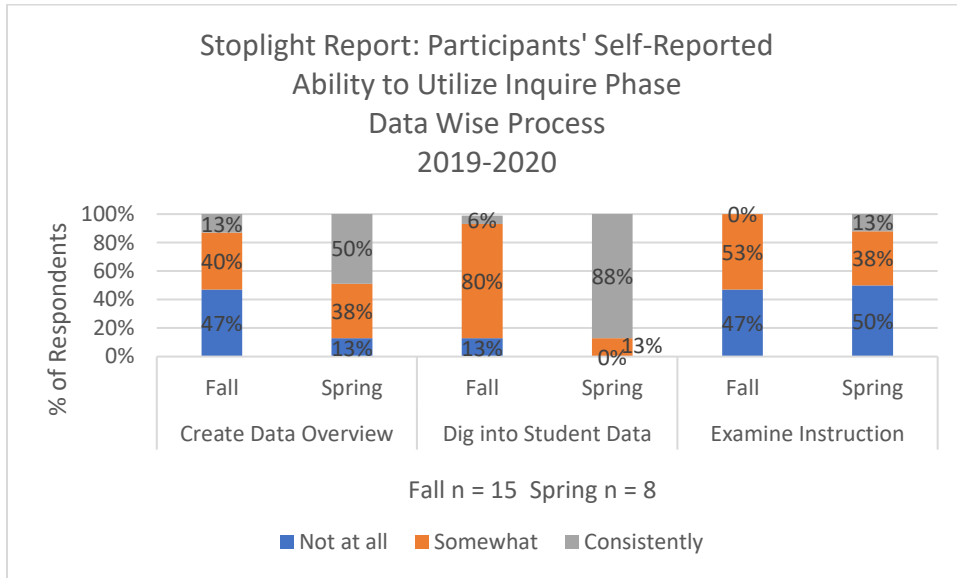
The percentage of respondents’ overall implementation of the Prepare phase which includes organization for collaborative work and assessment literacy is displayed in Figure 36. As noted, gains occurred in both areas. For each of the Stoplight figures, Fall *n* = 15, Spring *n* = 8.

Figure 4 *Stoplight Report: Participants’ Self-Reported Ability to Utilize Prepare Phase Data Wise Process 2019-2020*



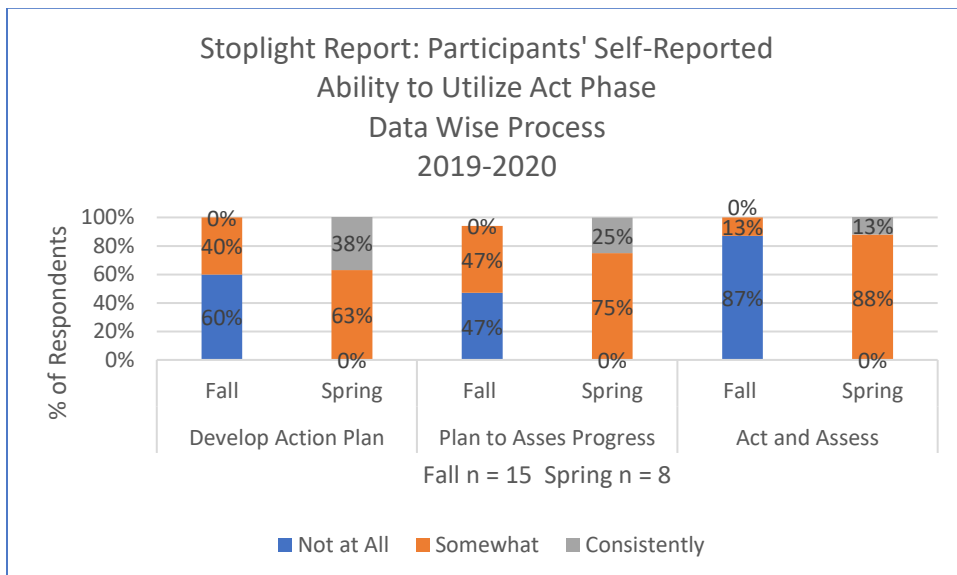
The percentage of respondents' overall implementation of the inquire phase which includes creating a data overview, digging into student data, and examining instruction are displayed in Figure 37. Gains are noted in each area.

Figure 5 *Stoplight Report: Participants' Self-Reported Ability to Utilize Inquire Phase Data Wise Process 2019-2020*



The overall implementation of the Act phase which includes developing an action plan, planning to assess progress, and acting and assessing are displayed in Figure 38. Gains are noted in each area.

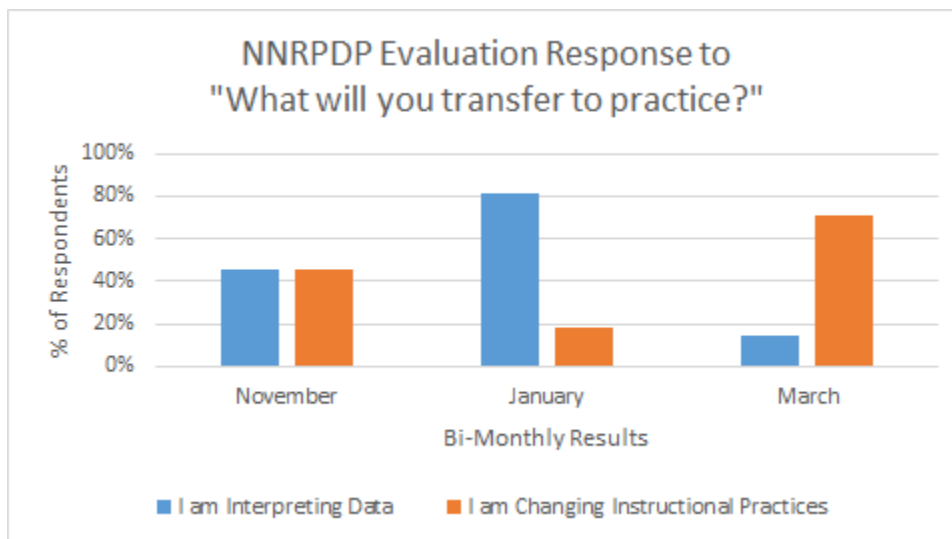
Figure 6 *Stoplight Report: Participants' Self-Reported Ability to Utilize Act Phase Data Wise Process 2019-2020*



NNRPDP Evaluation

NNRPDP Bi-Monthly Evaluation Response to “What will you transfer to Practice?” displayed in Figure 39 provides the tracking of teacher perception in their implementation of change from November through March. Results were compiled and quantified into the two variables, “I am interpreting data” and “I am changing instructional practice.” The chart shows an increase in data interpretation from November to January, then an increase in instructional changes from January to March.

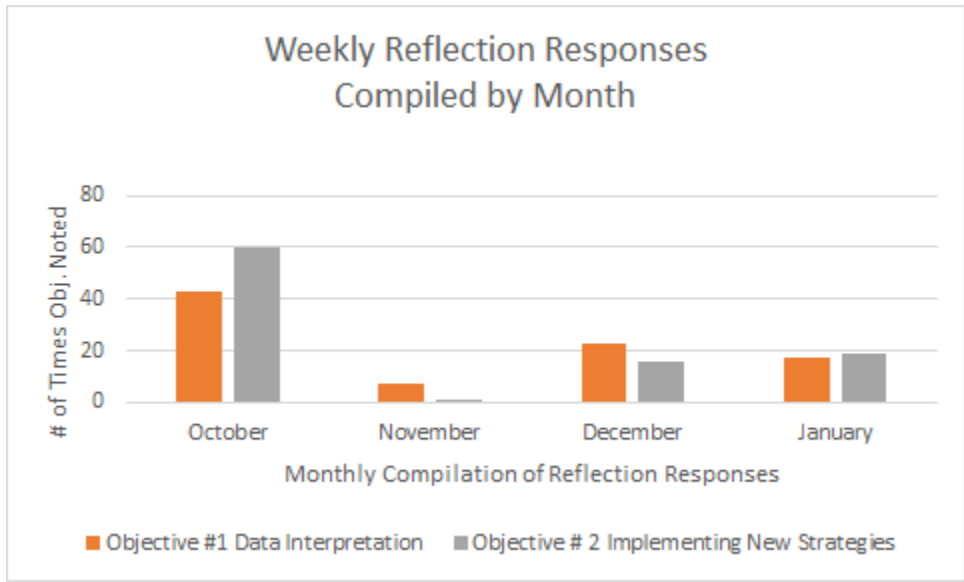
Figure 7 NNRPDP Bi-Monthly Evaluation Response to “What will you transfer to Practice?”



Weekly Reflection Responses

The number of mentions given to either of the two objectives in this project are displayed in Figure 40. If teachers noted in their reflection multiple instances of data interpretation or implementing of more than one new strategy that week, each instance was counted. Each month the number of teachers reflecting was roughly $n = 14$. November totals are based on only two sessions (reflections) due to parent teacher conferences and the Thanksgiving holiday (fewer whole group sessions that month).

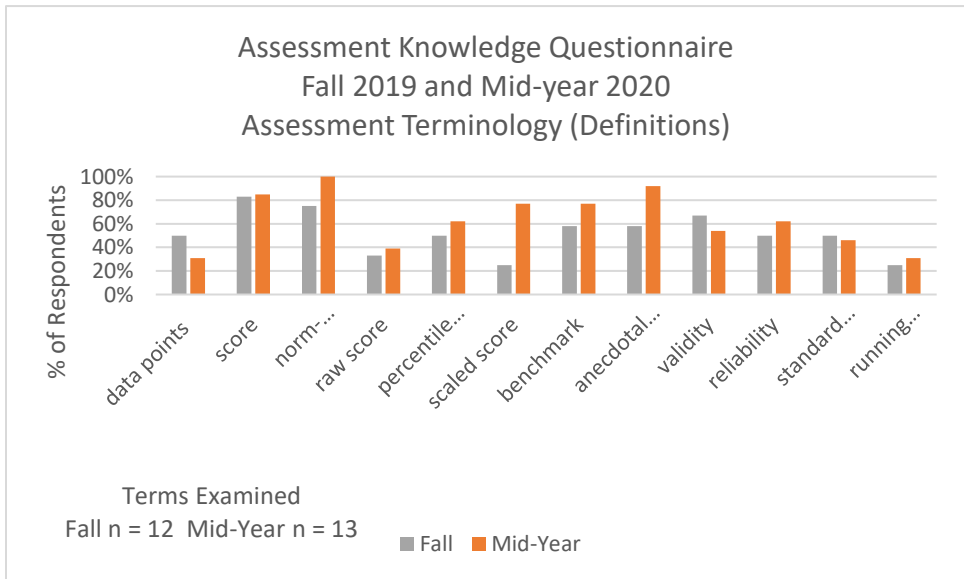
Figure 8 Weekly Reflection Responses Compiled by Month



Assessment Knowledge Questionnaire

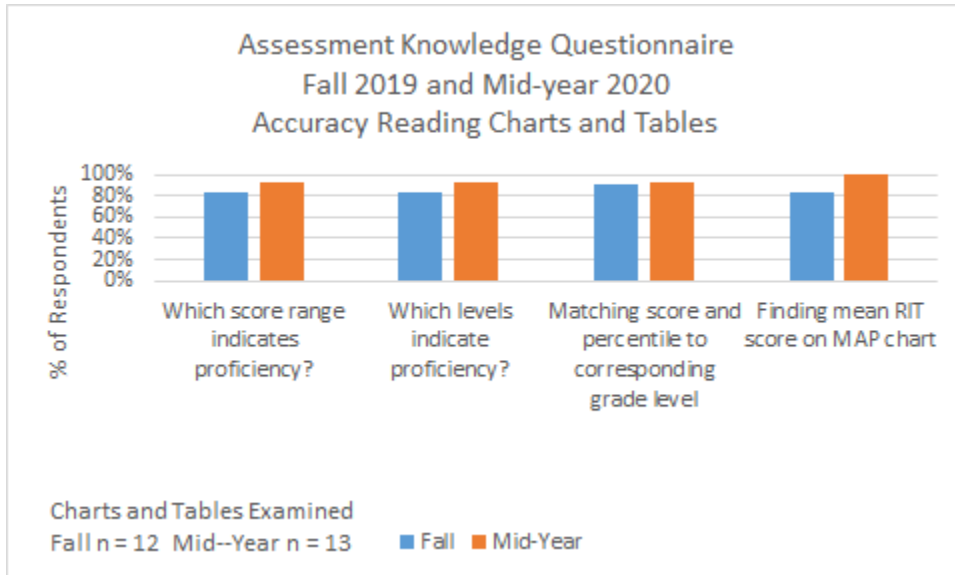
Both the starting point in teacher understanding of assessment terminology as well as the changes at mid-year are displayed in Figure 41.

Figure 9 Assessment Knowledge Questionnaire Fall 2019 and Mid-Year 2020 Assessment Terminology (definitions)



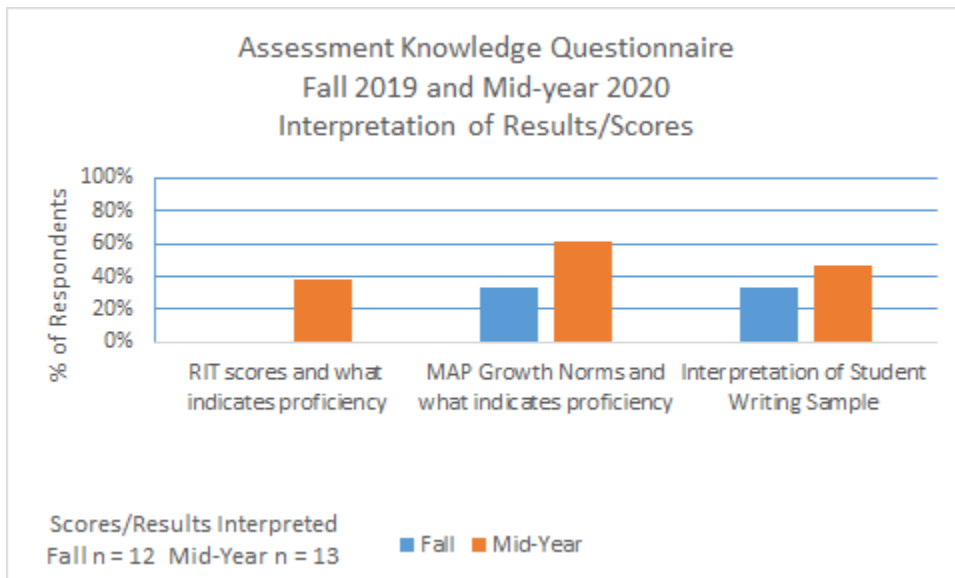
Teachers' accuracy in reading charts and tables related to common student assessments is displayed in Figure 42.

Figure 10 *Assessment Knowledge Questionnaire Fall 2019 and Mid-year 2020 Accurately Reading Charts and Tables*



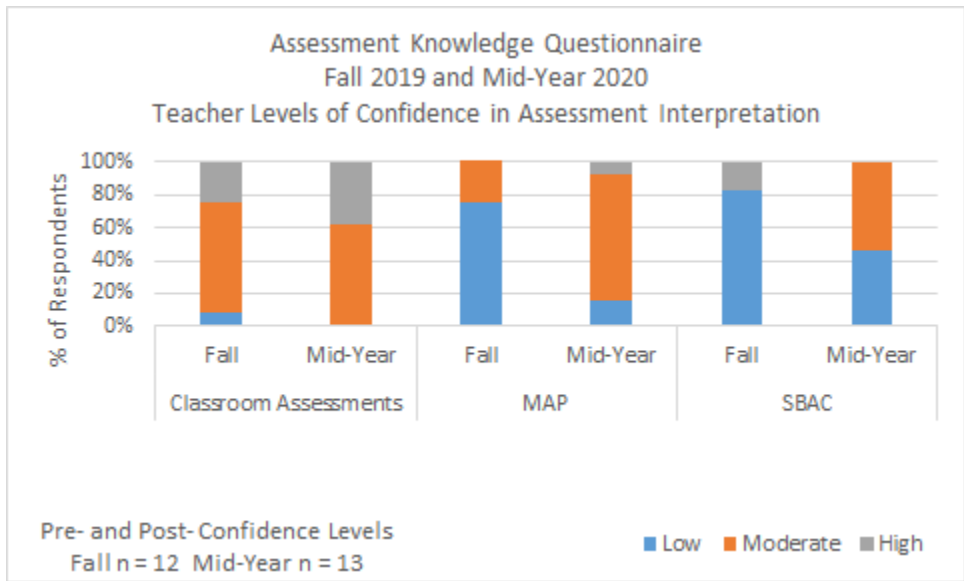
Teachers’ accuracy in interpretation of common student assessments is displayed in Figure 43. Of note is the RIT scores and what indicates proficiency fall score of 0% to 38% at mid-year. Growth norm proficiency also indicates a gain from fall at 33% to a mid-year of 62%. Interpretation of student writing increased from fall 33% to mid-year 46%.

Figure 11 *Assessment Knowledge Questionnaire Fall 2019 and Mid-year 2020 Interpretation of Results/Scores*



Teachers’ level of confidence from low, moderate, to high in the areas of classroom assessments, MAP results, and SBAC results are displayed in Figure 44.

Figure 12 *Assessment Knowledge Questionnaire Fall 2019 and Mid-year 2020 Teacher Levels of Confidence in Assessment Interpretation*



Coaching

Three classroom teachers and one long-term substitute (a total of four of the teaching staff) requested coaching from the NNRPDP facilitator. Coaching sessions were bi-weekly, for roughly 50 minutes. All four participants in coaching worked on literacy skills, either reading, writing, or both. Each session the coaching participants were encouraged to determine a short-term goal that they could accomplish related to literacy and student learning outcomes. Data interpretation and selection and implementation of strategies, while not the focus of the sessions, occurred in some sessions and was tracked in the coaching notes. These notes are inclusive of the data interpretation and analysis and instructional change (new implementation) only. The literacy notes are not included. As can be seen in the notes, (Figure 45) the coaching participants had individual gains in data analysis and interpretation as well as implementation of new strategies.

Figure 13 *Coaching Notes Including Teacher Data Interpretation and Selection and Implementation of Strategies*

Date	Coaching Notes
9.26.20	<p>Coaching Participant 1</p> <p>Conferring is where the teacher decided to go next, the facilitator shared a blank tracking graph to keep with the teacher’s composition notebook for tracking of writing conferences.</p> <ul style="list-style-type: none"> • Individual conferring with students about writing and data tracking are both new strategies for this teacher.
10.17.20	<p>Teacher reports that the tracking of the writing conferences is going well. She noticed that she is not meeting with all students each week, and is making an effort to do so now that she is aware. Her new goal is to implement running records (a new practice for her).</p>
11.14.20	<p>Shifted writing time based on teacher observation of need (learned observation skill in PL).</p> <p>Teacher added tracking of student application of lesson taught (each day or week). Teacher added a new strategy of ‘bookending’ the lesson by naming the learning objective before and after the teaching of the lesson.</p>
1.16.20	<p>Based on the new data tracking, the teacher noticed several students were not able to apply the lessons taught. The teacher and the facilitator discussed further assessments that might help the teacher pinpoint their learning difficulties-another new strategy for the teacher.</p>
2.6.20	<p>no new implementations noted.</p>
2.27.20	<p>Teacher noticed (based on new observation skills) too much time wasted while students prep for writing class. She moved the preparation for writing to before recess so that when they return from recess they can start the lesson. This is implementation of a new strategy. The facilitator supported the teacher in analysis of the running records for the struggling student noted earlier. Teacher was able to determine next steps appropriate for each student based on the data analysis (New data interpretation and analysis)</p>
3.12.20	<p>Teacher assessed all students with running records. This is implementation of a new strategy. Teacher continued with the analysis and interpretation of each student’s running record and determined next steps (new data analysis and new strategy).</p>

Date	Coaching Notes
10.28.20	Coaching Participant 2 Teacher has begun tracking spelling data with a tracker. Noticed a student had 100s then one day had only 13%. She noted that day that she did not have time for the lesson, and noticed this impacted his achievement. She has adjusted her lesson time to make sure she is not rushed through the lessons in future. (This is data interpretation and a change in practice.)
11.25.19/12.9.19/ 1.6.20	For each of the next three sessions, the teacher tracked the student application of the teaching point in that day's lesson.

Date	Coaching Notes
12.2.19	Coaching Participant 3 (first session, this participant requested coaching mid-year) Teacher (long-term substitute) noted the difficulty managing the writing mini-lesson and keeping it to a very short time, 10-15 minutes. We discussed using a timer, and she will implement this new strategy.
1.6.20	worked on classroom management issues. This teacher is implementing new strategies in classroom management (this is what she needs).
1.27.20	This teacher missed the half-day work prior to this session, so the facilitator and the teacher did that work today. Student writing samples were sorted based on levels of sophistication and the teacher was able to use the materials (learning progressions) to determine next steps for instruction for small groups and individual students. (data analysis and interpretation)
2.24.20	worked on classroom management issues.
3.9.20	worked on classroom management issues.

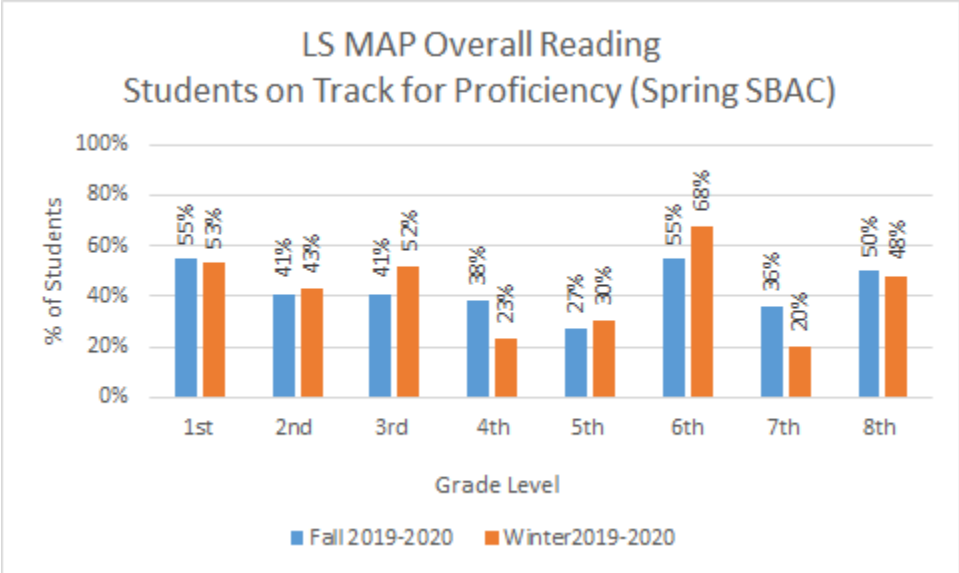
Date	Coaching Notes
9.16.19	Coaching Participant 4 New strategies discussed
9.30.19	Implementation of new teaching strategy-daily mini lesson
10.14.19	no new implementations noted.

Date	Coaching Notes
9.16.19	Coaching Participant 4 New strategies discussed
10.28, 11.25, 12.2.19	Attempted to meet each of these dates, the participant was unavailable.
12.9.19	no new implementations noted.
1.6.20	no new implementations noted.
2.3.20	no new implementations noted.

Measure of Academic Progress (MAP)

Students on track for reading proficiency results in Fall 2019-2020 and Winter 2019-2020 are displayed in Figure 46. NWEA provides a linking document with correlations between Smarter Balanced assessments (if taken in the spring) and MAP growth tests (See Appendix J). While correlations exist for grades 3-8, no correlations as yet exist for grades K-2. What is noted above as proficiency in grades K-2 is students between the 61-100%ile (generally considered meeting benchmarks). There are no ELA MAP projections available at this time for all Nevada Charter schools for SY 19-20. No Spring MAP assessments were administered in 2020. Gains in student growth in overall reading are noted in grades two, three, five, and six.

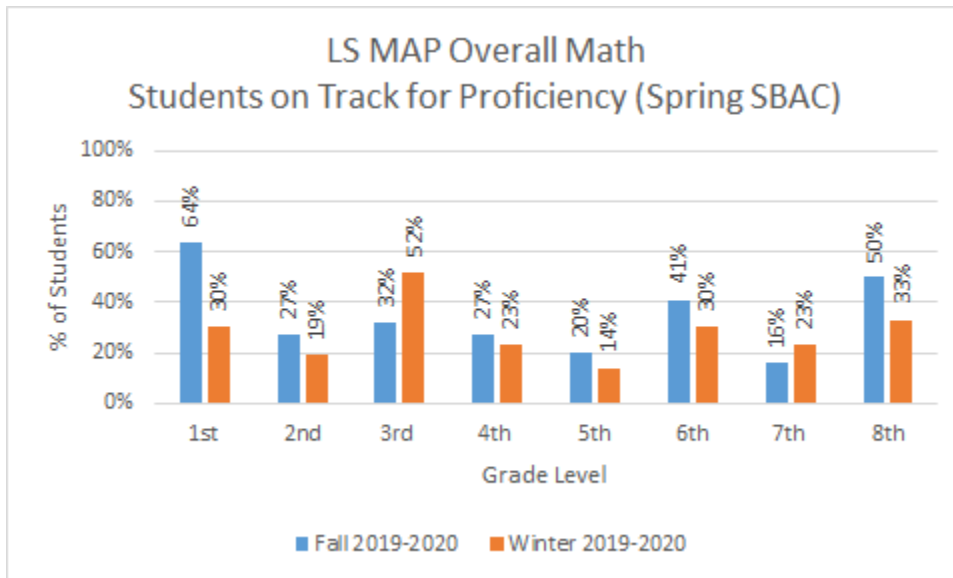
Figure 14 LS MAP Overall Reading Students on Track for Proficiency (Spring SBAC)



Students on track for math proficiency results in Fall 2019-2020 and Winter 2019-2020 are displayed in Figure 47. No Spring MAP assessments were administered. There are no Math MAP projections available at this time for all Nevada Charter schools for SY 19-20. A gain in student growth in overall math is noted in grade three and grade seven.

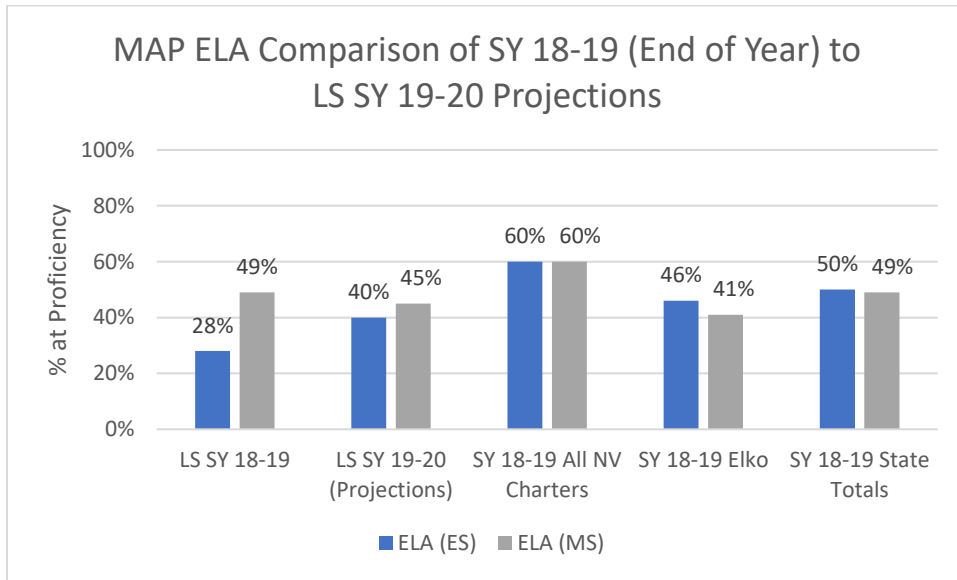
Kindergarten data is available for Winter 2019-2020 only (Kinder students at LS did not take the MAP in the Fall). Kindergarten Winter results in overall reading are 37% on track for proficiency and in overall math 42% on track for proficiency.

Figure 15 MAP Overall Math Students on Track for Proficiency (Spring SBAC)



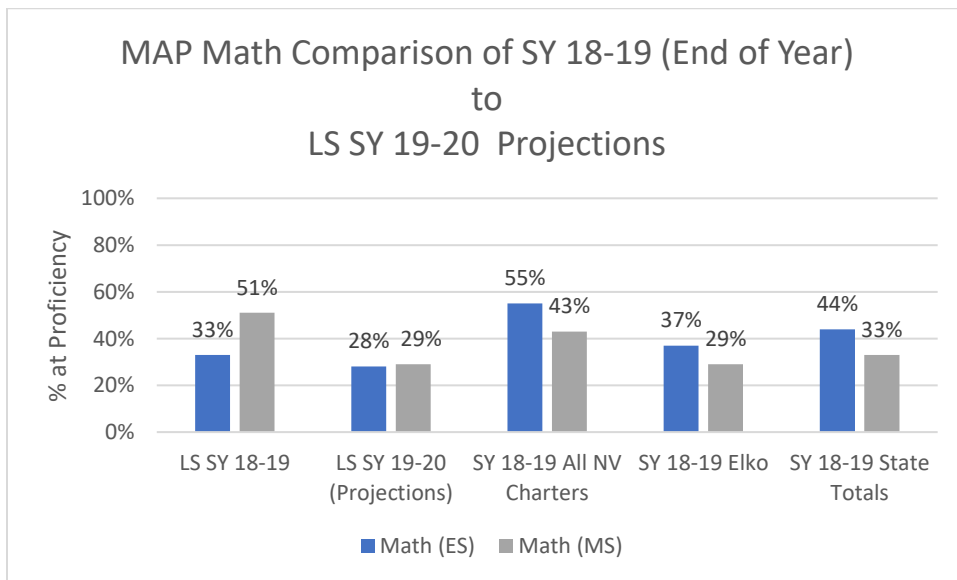
ELA results from school year 18-19 compared to the projected growth results based on what MAP considered on track for proficiency if the SBAC would have been taken in the spring of 2020 are displayed in Figure 48. No projections are available for All Nevada charter schools, Elko, or State totals. Included in LS ES are grade one and two scores which are taken from the 61st-100th%ile, the generally accepted levels for meeting the benchmark. Kindergarten scores are not included in the LS projection as LS kindergarten did not administer the fall MAP, so no growth scores are available.

Figure 16 MAP ELA Comparison of SY 18-19 (End of Year) to LS SY 19-20 Projections



Math results from school year 18-19 compared to the projected growth results based on what MAP considered on track for proficiency if the SBAC would have been taken in the spring of 2020. Results are displayed in Figure 49. No projections are available for All Nevada charter schools, Elko, or State totals. Included in LS ES are grade one and two scores which are taken from the 61st-100th%ile, the generally accepted levels for meeting the benchmark. Kindergarten scores are not included in the LS projection as LS kindergarten did not administer the fall MAP, so no growth scores are available.

Figure 17 MAP Math Comparison of SY 18-19 (End of Year) to LS SY 19-20 Projections



Discussion

Stoplight Report

The Stoplight Report pre and post surveys (Fall n = 15, Spring n = 8) detailed LS teacher responses to each phase of the Data Wise process, noting gains in both of the stated objectives:

1. Teaching staff will learn to interpret and compare data from multiple assessments (learner-centered problem).
2. Teachers will learn and implement new teaching strategies targeted to areas of need identified by data (problem of practice).

In the Prepare Phase, the *Organizing for Collaborative Work* targets the collaboration needed for implementation of the examination of instruction and development of action plans that occur later in the process and relate to objective 2, new teaching strategies targeted to areas of need. LS teachers in the fall all indicated that they somewhat collaborated, while in the spring more than 60% noted they collaborated consistently. *Build Assessment Literacy* is related to objective 1, data interpretation. More than 60% of LS teachers indicated this occurring consistently with 40% in the somewhat category and none in the not at all category. These gains tell a story of a teaching staff that is beginning to shift its overall teaching practice from one of a lack of consistent collaboration with peers and understanding of student assessment to a staff that is beginning to work together while creating deeper understanding about student assessment.

In the Inquire Phase, the *Creating Data Overview and Dig Into Student Data* sections both target objective 1 (data interpretation). Gains are noted in both areas with more than 80% of teachers indicating consistently digging into student data in the spring. *Examine Instruction* in this phase is related to objective 2 (new teaching strategies targeted to areas of need) and indicates a shift toward more consistent change. Of note in the examination of instruction is the decision made by the principal and the coordinators to delay the move to peer observation, in an effort to gain more teacher buy-in of peer observation. It seems possible that this delay, while perhaps necessary, delayed the implementation of new teaching strategies targeted to areas of student need.

In the Act Phase, the *Develop Action Plan, Plan to Assess Progress, and Act and Assess* all target objective 2 (data interpretation) and indicate clear growth from fall to spring. These pieces, when taken together, indicate the self-reported ability of teachers to use their skills from the previous steps of collaboration and data interpretation and analysis to then develop the plan to move the instruction forward for students in a well thought out, planned way. The LS teachers are able to examine student data and formulate a plan for instruction, plan for monitoring the success of that plan, and have moved from not implementing that plan at all (in the fall) to almost 90% somewhat implementation and roughly 15% consistently implementation (in the spring). Each piece in the Data Wise process is essential, but the *Act Phase* is where teachers are planning extensively, implementing a change, and monitoring the results. This is the heart of true

change in instructional practices. The evidence suggests a trend toward increased self-reported ability in these areas, yet there is much room for improvement. Teachers have begun what is considered a lifelong process of refining their instructional practice. Continued practice with these skills into the next school year will likely yield continued growth and student success. In future work through these phases, it might be beneficial for participants to examine the data from the fall to mid-year assessments. Participants would then see the growth they have made as well as become aware of next steps in their own progress and learning.

NNRPDP Evaluation

LS teacher responses to the question *What will you transfer to practice?* provides an interesting picture. In November, teacher responses were 46% in both data interpretation and changing of instructional practices. In January, data interpretation responses reach 80% as teachers become more comfortable with objective 1. Then, in March, objective 2 (new teaching strategies targeted to areas of need) surges to 70% as teachers begin implementation of new teaching strategies targeted to areas of need. This could be interpreted that teacher knowledge about data interpretation grew over the course of the fall, then they moved on to the next phase of new teaching strategies targeted to areas of need.

Weekly Reflection Responses

The *Weekly Reflection Response* took the place of the *End of Cycle Survey*. The End of Cycle Survey proved too cumbersome to complete each week in the brief 75-minute whole group session. Instead, teachers wrote to the prompt, “From today’s learning, what will you transfer to practice?” as that prompt fits best with the overall objectives of data interpretation and new teaching strategies targeted to areas of need and goals of professional learning.

LS teachers' weekly reflection responses indicated an initial (October) overwhelming response to both objective 1 (data interpretation) and objective 2 (new teaching strategies targeted to areas of need). This could be an indication of the initial learning curve required for both objectives. The following reflection responses appear to taper off, but still remain present throughout the intervention with roughly 20% of teachers noting incorporating both data interpretation and new strategies through December and January. The evidence suggests that teachers are continuing to incorporate data interpretation and new teaching strategies (only 20% of them each week), yet continued growth of this practice needs to be encouraged. It is essential that this process be continued into the next school year so that more teachers can incorporate these procedures into their instructional practice.

Assessment Knowledge Questionnaire

The Assessment Knowledge Questionnaire (Fall n = 12, Spring n = 13) has four overall sections that target objective 1 (data interpretation). The first section is *Assessment Terminology* and deals with assessment terms and definitions. This information provided the coordinators with the baseline of terminology knowledge of LS teachers. Gains are noted across the pre and post assessment. *Accuracy Reading Charts and Tables* section scores also provided baseline information, and growth is noted in all areas in the post assessment. *Interpretation of Results/Scores* section indicate growth in all areas. RIT scores and proficiency (MAP test) and MAP growth levels are key to understanding and using this student information accurately. Interpretation of results holds particular significance. The more accurately teachers can pinpoint their students' proficiency (strengths) and specific learning needs, the more accurately they can address those needs with instruction. Of particular note was the RIT scores and what indicates proficiency fall score of 0% which increased to 38% at mid-year. Growth norm proficiency also indicated a gain from fall at 33% to a mid-year of 62%. Clear interpretation of student writing samples increased from fall 33% to mid-year 46%, leaving much room for further growth. These gains indicate increased understanding about what the scores mean and can lead to more accurate planning of next steps with students. The gains indicated in these areas by LS teachers will enable them to accurately identify both student successes and student levels of need. Evidence suggests continued work in this area as only 38% of teachers are clearly understanding the relationship of the scores to student proficiency. Continued refinement of instructional practice in this area is needed.

Finally, the *Teacher Levels of Confidence in Assessment Interpretation* section (meeting objective 1, data interpretation) indicates that LS teacher confidence in assessment interpretation has increased across the board in classroom assessments, MAP, and SBAC. Gains in interpretation of classroom assessments are vital and ongoing, including the formative assessments done on a daily basis. LS teachers being more confident in the interpretation of these assessments could lead to targeted instruction based on student need. MAP data can also be essential for determining strengths and needs of students, and LS teacher confidence shifted toward moderate with some in the high confidence range. LS Teacher confidence in interpretation of SBAC results indicated roughly 80% low with some high in the fall to 40% low and nearly 60% moderate in the post assessment. It is possible that as LS teachers gained understanding of result interpretation their assumed high level from the fall came down to a more realistic moderate level in the post assessment as they began to understand what they did not know. Had the 2020 school year continued, interpretation of SBAC results would have continued. Work with the data, performing analysis in collaborative teams will continue to build teacher confidence levels as they become more comfortable with the many different assessments and their uses. It is essential that this work continue into the next school year because teachers have only scratched the surface. The gains in confidence with only one year (cut short in mid-March) of professional learning are impressive and would most likely only increase with

continued practice and experience. Had the school-year not ended abruptly, close examination of this assessment could have provided an additional model of data analysis and next steps for participants and should be considered in future work.

Coaching

Four of the 13 LS teachers (31%) requested literacy coaching. It is perhaps important to reiterate here 31% of the teaching staff volunteering for individual coaching. This very clearly speaks to the motivation of teachers at LS and their willingness to work with NNRPDP coordinators as they learn and grow their personal instructional practices. Not all teachers are willing or able to take the risk of putting themselves under the scrutiny of thoughtful self-reflection in this way. In addition, participating in individual coaching also requires a time commitment. Teachers in coaching agree to give up one preparatory hour bi-weekly. This, again, speaks to the commitment and motivation levels of the LS teachers involved.

As noted above, the coaching did not specifically target objective 1 (data interpretation). However, objective 2 (new teaching strategies targeted to areas of need) applies, at least in the area of literacy, which was the primary focus of the coaching. Data interpretation did occur, probably more so than it would have based on the weekly work with data that was already occurring at LS.

As expected, each coaching participant had individual needs and therefore individual results with implementation of the objectives of data interpretation and new teaching strategies targeted to areas of need. Each participant made gains toward their individual goals.

Measure of Academic Progress (MAP)

English Language Arts (ELA)

As noted above, the correlation between MAP scores and students on track for proficiency on the Spring administered SBAC (had it been administered) exists for grades 3-8. In grades K-2 the scores noted in overall reading are taken from the 61st-100th%ile, the generally accepted levels for meeting the benchmark (Kindergarten scores are available for winter proficiency only, results noted above). Overall gains are noted in grades two, three, five, and six. Evidence suggests a continued focus on ELA as the gains made need to increase and some grade levels did not make gains at all. Teachers need to be encouraged to continue the inquiry process, with a focus to ELA and best pedagogical practices. Continued refinement of data analysis will assist teachers as they determine student needs and potential next steps for optimal student growth.

Mathematics

In overall math and students on track for proficiency on the Spring administered SBAC (had it been administered) displays student growth in grade three and grade seven. Of concern is that not only did the other grades not make gains in math growth (projections), but the scores dropped. The evidence suggests specifically including math as a content focus for continued work in the upcoming school year. Teachers could be encouraged to alternate their inquiry work between ELA and math as they build their skills in data analysis in both content areas and also in best pedagogical practices in both content areas.

MAP ELA and Math Comparison of SY 18-19 (End of Year) to LS SY 19-20 Projections

Both the ELA and Math scores from the end of year 18-19 and the LS projections displayed together form a broad context for the scores. Projections are not available for all charter schools, Elko, or the state totals. Clear growth is projected in LS ES (ELA). This growth is evidence of student achievement getting much closer to local and state totals. LS Math indicated a drop from SY 18-19 to the 19-20 projections, yet remains not far from the local and state totals, while all Nevada charter schools have higher achievement in math. It is clear that although there were decreases in math student achievement, LS made gains in ELA. A continuation of the work begun with a broad focus on both math and ELA content could support continued gains in ELA and future gains in math.

Conclusion

The primary findings from the evidence collected in pre and post assessments as well as the ongoing reflection responses suggest some areas of success as well as some areas in need of increased improvement in the Data Wise process of Collaborative Inquiry Teams professional learning at LS. In particular, LS teachers indicated gains in all three phases of the process (Prepare, Inquire, and Act), and it will be important to maintain that momentum and move toward increasing the improvements into the consistent range for all teachers. Given the time and resources to continue this work into the next school year, these trends of improvement will likely continue. LS teachers have already mastered a great deal of the assessment literacy required (based on the Knowledge Assessment Questionnaire) as well as made improvements in data interpretation and analysis (objective 1). There is still room for further growth in this area. It would be optimal to do significance testing in future years when there is more data with which to work.

LS teachers also indicated evidence of an implementation of new teaching strategies targeted to areas of need (objective 2). An extension of the work into the following school year would likely also continue this positive trend.

One area in need of improvement is the peer observation piece that is part of the examination of instruction as well as the development of an action plan. As LS teachers incorporate peer observation into their collaborative inquiry process they will be able to refine the use of new instructional strategies while also expanding their knowledge of pedagogical practices.

Based on the student evidence (those on target for proficiency on the Spring SBAC), there is still work that needs to be done. Overall gains were noted in the elementary level in ELA. This means that middle school ELA and all levels of math remain areas of concern. One possible change could be the addition of individual math coaching as a way of boosting the inquiry process in math and adding new teaching strategies targeted to areas of need in math specifically. In addition, all the literacy coaching occurred with elementary teachers. Another possible solution might be a concerted effort to encourage middle school teachers to participate in individualized literacy coaching.

Evidence suggests the Collaborative Inquiry Teams were successful, yet there is still much more work to be accomplished to both maintain the current levels of LS teachers in objective 1 (data interpretation) and objective 2 (new teaching strategies targeted to areas of need). In particular, peer observation of practice is a powerful piece of pedagogical learning that has not yet been tapped. This process could lead to ongoing pedagogical learning with wide-reaching outcomes. If limitations of resources were not an issue, collaborative inquiry teams would meet weekly to plan, discuss pedagogy, implement new instructional strategies, reflect on the process, and extend their personal pedagogical practices through the peer observation framework. As noted in the evidence, some of the data interpretation and analysis practices have become part of LS teachers' daily practice. One change of note for future work should include a specific focus in math content pedagogical strategies. The addition of specific collaboration skills could also lend an added layer of expertise to LS teachers and enhance the current teams. Continued careful tracking of student achievement data in future years (in context with state and local achievement data) will add to the evaluation of this collaborative inquiry team process. In addition, tracking of individual teacher progress from year to year (different students, same teacher) could lend even more specific information for the evaluation of the collaborative inquiry team effectiveness.

References

- Amels, J., Krüger, M., Suhre, C. *et al.* (2019) Impact of inquiry-based working on the capacity to change in primary education. *J Educ Change* 20, 351–374.
<https://doi.org/10.1007/s10833-019-09337-3>
- Boudett, K., City, E., & Murnane, R., (2018) *Data Wise: A step-by-step guide to using assessment results to improve teaching and learning*. Cambridge, MA: Harvard Education Press.

Darling-Hammond, L., Hyler, M.E. & Gardner, M. (2017). *Effective teacher professional development*. https://learningpolicyinstitute.org/sites/default/files/product-files/Effective_Teacher_Professional_Development_REPORT.pdf

Guskey, T.R. (2002). Does it make a difference? Evaluating professional development. *Educational Leadership*, 59(6), 45-51.

Lai, M. K., & McNaughton, S. (2016). The impact of data use professional development on student achievement. *Teaching and Teacher Education*, 60, 434-443.

Murray, J. (2014). *Designing and implementing effective professional learning*. Thousand Oaks, CA: Corwin.

Nevada Department of Education. (n.d.) *Nevada Report Card*.
http://nevadareportcard.nv.gov/DI/nv/state_public_charter_school_authority/elko_institute_for_academic_achievement/2019

Sun, J., Przybylski, R. & Johnson, B.J. (2016). A review of research on teachers' use of student data: from the perspective of school leadership. *Educ Asse Eval Acc* 28, 5–33.
<https://doi.org/10.1007/s11092-016-9238-9>