



## **Middle School Math Fellowship: Year 2**

Nevada's mission is to improve student achievement and educator effectiveness by ensuring opportunities, facilitating learning, and promoting excellence. To achieve this mission, Nevada has set aggressive goals to improve student performance; one of which is to increase Nevada's middle school students' proficiency rates as measured by Smarter Balanced Assessment Consortium (SBAC) criterion referenced tests. In the New Nevada Plan, Nevada identified the goal to improve math proficiency from the 27% baseline proficiency rate to a 46% proficiency rate by 2022. The New Nevada Plan identifies the Northeastern Nevada Professional Development Program (NNRPDP) as a crucial partner in reaching this goal. As a crucial partner, the NNRPDP created the Middle School Math Fellowship (Fellowship) to support Nevada's educators and students in achieving Nevada's goal by providing professional development supports to deepen understandings of student achievement targets outlined by SBAC and to strengthen instructional practice.

### **Initial Data and Planning**

Nevada earned a D ranking, second to last in the nation, from the 2019 Quality Counts report. The Nation's Report Card reported Nevada at a 27% proficiency rate for eighth grade mathematics. Compared to 13 states in the consortium, Nevada ranked near the bottom for performance on the SBAC 6-8 grade mathematics assessments with a 32% proficiency rate in 2017-2018 and a 33% proficiency rate in 2018 - 2019. Proficiency rates for the northeast region were comparable in 2018 - 2019 with Eureka County at 44%, Lander County at 37%, Elko at 34%, Humboldt County at 34%, White Pine at 24%, and Pershing County at 22%. The Nevada Every Student Succeeds Act (ESSA) Advisory Group (2019) recommended Nevada strive to increase mathematics proficiency rates to 46% proficiency by 2022. The regional professional development programs are identified in The New Nevada Plan as an instrumental component in leading the charge to achieve Nevada's goals (2017, p. 38).

Potential root causes identified for the middle school students' mathematical proficiency ratings is the lack of understanding of the necessary instructional shifts associated with the Nevada Academic Content Standards for Mathematics (NVACS-M) Major Works of the Grade and the SBAC Claims. Indeed, in *Principles to Actions*, the National Council of Mathematics identified the need for instructional shifts to occur in order to improve students' mathematics achievement as "too much focus is on learning procedures without any connection to meaning, understanding, or the applications that require these procedures" (2014, p. 2). Mathematics educators need to be aware of and understand these shifts and become inspired to employ them in their practice. Recognizing a lack of understanding of the instructional shifts undermines the ability to improve instructional practices and impact student performance. The NNRPDP was

employed as the intervention to support middle school math teachers' understandings of the NVACS-M Major Work of the Grades and the SBAC Claims.

The NNRPDP has three Mathematics Specialists on staff who possess the capacity to support educators throughout the region. In addition to graduate degrees in mathematics and National Board Certification in Adolescent Mathematics, the specialists have served on SBAC committees, such as performance assessment writing committees, achievement level setting committees, and the State Network of Educators for the Digital Library. The Mathematics Specialists have participated in work with the mathematics standards at the local, state, national, and collegiate level. The NNRPDP Mathematics Specialists have presented at local, state, and national conferences and have facilitated innumerable courses, workshops, and professional development opportunities related to NVACS-M across the region.

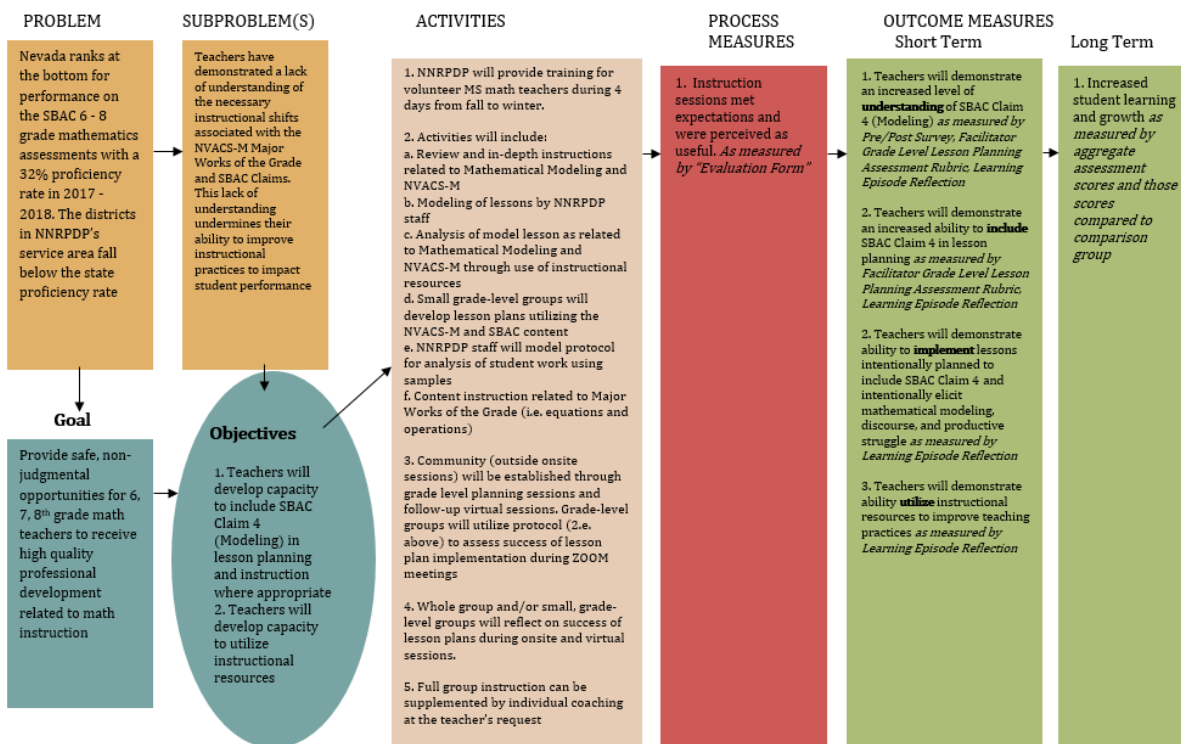
The ultimate goal for the Fellowship was to increase students' mathematical proficiency levels by improving educators' ability to create and deliver rigorous instruction aligned with the NVACS-M. The NNRPDP Mathematics Specialists' expertise served to inform the planning of the ongoing and sustained professional development structure of the Fellowship, which included:

- Defining measurable goals
- Obtaining director approval
- Earmarking funding for substitutes
- Securing an online platform for planning and debriefing meetings
- Reserving a venue for full day sessions
- Obtaining the approval and support of superintendents of the region's six counties
- Recruiting Efforts:
  - Flyer, Registration Form, and Process
  - Emailing superintendents and/or curriculum directors (dependent on district personnel) and principals in region to generate awareness of learning opportunity for middle school math teachers
  - Follow up with Fellows who participated in Year 1 of the Fellowship via an email to inform how feedback from Year 1 of the Fellowship was used to inform the design of Year 2 of the Fellowship and invite to participate in Year 2
  - Personal conversations with middle school math teachers as opportunities arise to invite to participate
- Obtaining Southern Utah University (SUU) credit for Fellowship participation
  - Draft and submit course proposal for SUU credits
  - Draft directions for how to enroll and apply for SUU credits
  - Establish a MySchoolBucks account for SUU credits to be processed and paid for by the participant
  - Monitor fulfillment of course requirements
- Planning Fellowship sessions with NNRPDP Mathematics Specialists
- Meeting with curriculum directors, contacting Data Recognition Corporation (DRC), contacting the Nevada Department of Education (NDE) assessment department to determine what SBAC data are, or can be, made available to teachers

- Generating session structures:
  - Whole-group presentation on the concepts associated with the Major Works of the Grade the Grades to deepen participants’ understanding of misconceptions, progressions, instructional methods
  - Grade level lesson planning breakout sessions for grade level teams to plan a lesson in a unit of instruction that lends itself to mathematical modeling
- Examining, reflecting, revising, and adjusting the Fellowship
- Reporting results

The Mathematics Specialists’ objectives for Year 2 of the Fellowship included developing the fellows’ capacity to incorporate SBAC Claim 4: Mathematical Modeling and Data Analysis into lesson planning and instruction where appropriate and to utilize related instructional resources. To achieve the objectives, the Mathematics Specialists established roles and responsibilities, implementation timelines, resources, and monitoring strategies as outlined in the following Logic Model (Figure 15):

**Figure 1** Middle School Math Fellowship: Year 2 Logic Model



## Method

### Learning Design

The NNRPDP is called upon by members in the region and the state as an intervention measure to impact desired outcomes. The effectiveness of the NNRPDP is evidenced in annual reports to stakeholders and outlined in professional learning plans based on research-based practices. The NNRPDP Mathematics Specialists' learning design of the Fellowship was informed by the New Nevada Plan (2017), Nevada's Standards for Professional Development (2018), Guskey's Five Levels of Professional Development (2002), the U.S. Department of Education's guidance document, Non-Regulatory 2 Guidance: Using Evidence to Strengthen Education Investments (2016), and effective teacher professional development research. The content and foci of the Fellowship was informed by the Nevada Academic Content Standards for Mathematics (NVACS-M), the National Council of Teachers of Mathematics, Institute of Education Sciences, SBAC, Achieve the Core, and research from mathematics leaders in the field.

The Mathematics Specialists' constructed a Professional Learning Plan delineating the Fellowship's goals and alignment with the Nevada Standards for Professional Development (see Appendix N) to formulate the design of the Fellowship. The Mathematics Specialists' learning design of the Fellowship incorporated the seven elements of effective professional development (Table 20) identified in a review of 35 studies conducted by Darling-Hammond, Hyler, and Gardner, with assistance from Espinoza (2017).

**Table 1** *NNRPDP's Incorporation of the Seven Elements of Effective Professional Development*

<b>Professional Development Element</b>	<b>Fellowship Design: Element Alignment Evidence</b>
Content Focus	The Fellowship's intentional focus on discipline-specific curriculum development and pedagogies is reflected in: <ul style="list-style-type: none"><li>• Focus on SBAC Claim 4 (mathematical modeling)</li><li>• Focus on implementation of SBAC Claim 4 (Mathematical Modeling) into instructional episode</li><li>• Focus on instructional resources</li></ul>
Active Learning	The opportunity for engagement in active learning in the Fellowship is reflected in: <ul style="list-style-type: none"><li>• Mathematical modeling lessons modeled by NNRPDP mathematical specialists</li><li>• Model lesson analysis</li></ul>
Collaboration	The creation of space for sharing ideas and collaboration in the Fellowship is reflected in: <ul style="list-style-type: none"><li>• Model lesson analysis</li><li>• Content learning</li></ul>

## **Professional Development Element**

## **Fellowship Design: Element Alignment Evidence**

	<ul style="list-style-type: none"><li>• Planning learning episodes</li><li>• Debriefing learning episodes</li><li>• Analyzing student work</li></ul>
Models of Effective Practice	The modeling of effective practice in the Fellowship is reflected in: <ul style="list-style-type: none"><li>• Model lessons</li><li>• Learning episode planning considerations and resources content and organizers</li><li>• Learning episode planning</li><li>• Student work analysis</li></ul>
Coaching and Expert Support	The sharing of expertise and best practices targeting individual needs in the Fellowship is reflected in: <ul style="list-style-type: none"><li>• Learning episode planning</li><li>• Student work analysis</li><li>• Individual supports offered outside of the official sessions via classroom visits, emails, and/or virtual meetings</li></ul>
Feedback and Reflection	The facilitation of reflection and solicitation of feedback in the Fellowship is reflected in: <ul style="list-style-type: none"><li>• Model lesson analysis</li><li>• Content focus debrief</li><li>• Learning episode planning</li><li>• Learning episode debrief</li><li>• Student work analysis</li></ul>
Sustained Duration	Adequate time to learn, practice, implement, and reflect is evidenced in the Fellowship reflected in: <ul style="list-style-type: none"><li>• Ongoing over two academic school years</li><li>• Multiple sessions offered during school years</li></ul>

## **Participants and Procedure**

In the 2018 - 2019 school year, 20 middle school math teachers and two principals from districts in NNRPDP's region (i.e. White Pine, Eureka, Humboldt, Elko, Lander, and Pershing County) participated in Year 1 of the Fellowship. Approximately 50 middle school mathematics teachers from these same districts were invited to participate in Year 2 of the Fellowship during the 2019 - 2020 school year. Out of the 14 Fellows registering for Year 2 of the Fellowship, one was a middle school principal, five were 6th grade mathematics educators, three were 7th grade mathematics educators, one was an 8th grade mathematics educator, and four were 6-8 grade mathematics educators. Seventy-one percent of the Year 2 registrants had also participated in Year 1 of the Fellowship. Seventy-nine percent of the Fellows were from Elko County School District, 7% from White Pine School District, 7% from Humboldt County School District, and 7% from charter schools. Nine of the 14 registrants attended all of the Fellowship sessions. Of the five registrants not attending all of the sessions, three stated issues relating to health as the

cause and one stated travel concerns as a reason for not attending all of the sessions. The Fellowship impacted approximately 700 students the nine Fellows collectively teach.

Registration for the Fellowship opened in August 2019. The first session was held in September 2019, and the Fellowship ended in December 2019. The overarching intentions of the Fellowship were to deepen understandings of the interconnections of SBAC Claims and the Nevada Academic Content Standards for Mathematics to inform and strengthen practice in order to impact student achievement. The Fellowship involved four on-site full-day sessions held in the central location for the region, Elko, Nevada, and three virtual sessions using the Zoom platform. To gain insights from national perspectives, the structure (Table 21) was also adapted to include optional attendance to a presentation on rigor given by a national speaker at the Teacher Academy in Elko, NV.

**Table 2** *Fellowship Session Structure and Session Overview*

<b>Session Structure</b>	
<b>On-site/Full Day</b>	<b>Virtual</b>
9:00 - 11:45: Whole-group presentation on the concepts association with the major of the grade(s) to deepen participants’ understanding of misconceptions, progressions, instructional methods	4:00 - 4:30 Debrief Implementation
11:45 - 1:00: Lunch	4:30 - 6:00 pm Student Work
1:00 - 3:00: Break out into grade level teams to intentionally plan a learning episode that incorporates SBAC Claim 4: Mathematical Modeling.	Analysis

<b>Session Overview</b>			
<b>Date</b>	<b>Type</b>	<b>Focus</b>	
September 23, 2019	On-site/Full day	Whole Group Session <ul style="list-style-type: none"> <li>• Overview of SBAC Claims</li> <li>• SBAC Claim 4 Model lesson</li> </ul> Grade Level Planning Breakout Sessions <ul style="list-style-type: none"> <li>• Introduction of intentional lesson planning structure with analyses of SBAC Claims via model lesson analysis</li> <li>• Introduction of intentional planning structure and considerations of rigor, Major Work of the Grade, SBAC Claims, productive struggle, productive discourse, resources</li> <li>• Introduction to student work analysis protocol</li> <li>• Overview of resources</li> </ul>	

<b>Date</b>	<b>Type</b>	<b>Focus</b>
October 7, 2019	On-site/Full day	Whole Group Session <ul style="list-style-type: none"> <li>• Incorporation of modeling (SBAC Claim 4) via lesson modifications</li> </ul> Grade Level Planning Breakout Sessions <ul style="list-style-type: none"> <li>• SBAC Claim 4 intentional planning</li> </ul>
October 23, 2019	Virtual	Grade Level Sessions <ul style="list-style-type: none"> <li>• Lesson implementation debrief</li> <li>• Student work analysis</li> </ul>
November 4, 2019	On-site/Full day	Whole Group Session <ul style="list-style-type: none"> <li>• Model lesson</li> <li>• Distinguishing problem solving (SBAC Claim 2) from modeling (SBAC Claim 4)</li> </ul> Grade Level Breakout Sessions <ul style="list-style-type: none"> <li>• SBAC Claim 4 intentional planning</li> </ul>
November 19, 2019	Virtual	Grade Level Sessions <ul style="list-style-type: none"> <li>• Lesson implementation debrief</li> <li>• Student work analysis</li> </ul>
December 3, 2019	On-site/Full day	Whole Group Session: <ul style="list-style-type: none"> <li>• Model lesson</li> <li>• Defining and incorporation mathematical modeling and data analysis into instruction (SBAC Claim 4)</li> <li>• Productive Struggle</li> </ul> Grade Level Breakout Sessions: <ul style="list-style-type: none"> <li>• SBAC Claim 4 intentional planning</li> </ul>
December 18, 2019	Optional: On-site/Full day presentation on rigor	Teacher Academy <ul style="list-style-type: none"> <li>• Defining rigor and incorporation into instruction</li> </ul>
January 2020	Final Reflections	Lesson implementation and student learning analysis

## **Measurement**

The long-term goal of the Fellowship is to address middle school mathematics achievement levels by deepening middle school mathematics teachers' understandings of student achievement targets outlined by SBAC in order to strengthen instructional practice by increasing rigor. The long-term outcome and overall measure of the Fellowship is to:

1. Increase student learning and growth as measured by aggregate assessment scores from participating educators, and those same scores analyzed against a comparison group.

Year 2 of the Fellowship targeted the objectives to develop the Fellows' capacity to include SBAC Claim 4 (Mathematical Modeling) in lesson planning and instruction where appropriate and utilize instructional resources. The short-term outcomes and measures of the Fellowship are as follows:

1. Fellows will demonstrate an increased level of understanding of SBAC Claim 4 (Mathematical Modeling) as measured by the Pre/Post Survey, Facilitator Grade Level Lesson Planning Assessment Rubric, Learning Episode Reflection, and Claim Identification.
2. Fellows will demonstrate an increased ability to include SBAC Claim 4 (Mathematical Modeling) in lesson planning as measured by Facilitator Grade Level Lesson Planning Assessment Rubric and Learning Episode Reflection.
3. Fellows will demonstrate ability to implement lessons intentionally planned to include SBAC Claim 4 (Mathematical Modeling) and intentionally elicit mathematical modeling, discourse, and productive struggle as measured by Learning Episode Reflection.
4. Fellows will demonstrate the ability to utilize instructional resources to improve teaching practices as measured by the Facilitator Grade Level Planning Assessment Rubric and Learning Episode Reflection.

Qualitative and quantitative measurements were used to assess the following variables:

- **Increased levels of awareness:** Teachers who have completed Fellowship will demonstrate an increased level of awareness of NVACS-M Major Works of the Grade and SBAC Claims, in particular SBAC Claim 4 (Mathematical Modeling).
- **Increased levels of understanding:** Teachers who have completed Fellowship will demonstrate an increased level of understanding of NVACS-M Major Works of the Grade and SBAC Claims, in particular Claim 4 (Mathematical Modeling).
- **Increased ability to create lesson plans:** Teachers who have completed Fellowship will demonstrate increased ability to create lesson plans that are intentionally planned with NVACS-M Major Works of the Grade and SBAC Claims, in particular Claim 4 (Mathematical Modeling)
- **Increased ability to implement lesson plans:** Teachers who have completed the Fellowship will demonstrate increased ability to implement lesson plans utilizing components of NVACS-M Major Works of the Grade and SBAC Claims, in particular Claim 4 (Mathematical Modeling).
- **Increased ability to Assess Student Work:** Teachers who have completed the Fellowship will demonstrate an increased ability to assess student work in relation to NVACS-M Major Works of the Grade and SBAC Claims, in particular Claim 4 (Mathematical Modeling).
- **Increased ability to Utilize Instructional Resources:** Teachers who have completed the Fellowship will demonstrate an increased ability to utilize instructional resources to improve teaching practices.

The variables informed the evaluation plan based on Guskey's (2002) Five Levels of Professional Development. See Table 22. Note that no analysis was conducted to determine significance of associations due to the low *n* value. Italicized text is specific to this intervention.



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

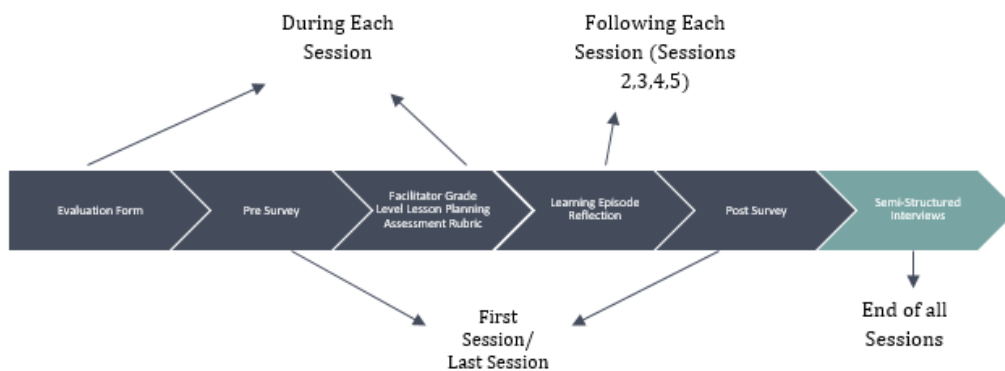
<b>Evaluation Level</b>	<b>What Questions Are Addressed?</b>	<b>How Will Information Be Gathered?</b>	<b>What Is Measured or Assessed?</b>	<b>How Will Information Be Used?</b>
<b>1. Participants' Reactions</b>	<i>Training expectations, presenter skills, increased knowledge, motivation to improve</i>	<i>State Evaluation Form Semi-structured Interviews</i>	<i>Initial satisfaction with the experience</i>	<i>To improve program design and delivery</i>
<b>2. Participants' Learning</b>	<i>Did participants acquire the intended knowledge and skills?</i>	<i>Facilitator Grade Level Lesson Planning Assessment Rubric  Learning Episode Reflection  Claim Identification Assessment  Pre/Post Survey</i>	<i>Participants' increased understanding of SBAC Claim 4 (Mathematical Modeling)</i>	<i>To improve program content, format, and organization</i>

<b>Evaluation Level</b>	<b>What Questions Are Addressed?</b>	<b>How Will Information Be Gathered?</b>	<b>What Is Measured or Assessed?</b>	<b>How Will Information Be Used?</b>
<b>3. Organization Support &amp; Change</b>	<p><i>Was implementation advocated, facilitated, and supported?</i></p> <p><i>Was the support public and overt?</i></p> <p><i>Were problems addressed quickly and efficiently?</i></p> <p><i>Were sufficient resources made available?</i></p> <p><i>Were successes recognized and shared?</i></p> <p><i>What was the impact on the organization?</i></p> <p><i>Did it affect the organization's climate and procedures?</i></p>	<p><i>Learning Episode Reflection</i></p> <p><i>Post Survey</i></p> <p><i>Semi-structured Interviews (by third-part independent evaluator)</i></p>	<p><i>The organization's advocacy, support, accommodation, facilitation, and recognition</i></p>	<p><i>To document and improve organization support</i></p> <p><i>To inform future change efforts</i></p>
<b>4. Participants' Use of New Knowledge and Skills</b>	<p><i>Did participants effectively apply the new knowledge and skills?</i></p>	<p><i>Facilitator Grade Level Lesson Planning Assessment Rubric</i></p>	<p><i>Participants' ability to implement lessons plans utilizing SBAC Claim 4</i></p>	<p><i>To document and improve the implementation of program content</i></p>

<b>Evaluation Level</b>	<b>What Questions Are Addressed?</b>	<b>How Will Information Be Gathered?</b>	<b>What Is Measured or Assessed?</b> <i>(Mathematical Modeling)</i>	<b>How Will Information Be Used?</b>
		<i>Learning Episode Reflection</i>		
		<i>Semi-Structured Interviews</i>		
<b>5. Student Learning Outcomes</b>	<p>What was the impact on students?</p> <p>Did it affect student performance or achievement?</p>	<p><i>SBAC (math) scores aggregated by cohort of MS Math Fellows, measured against service area totals and/or comparison group annually, per grade</i></p>	<i>Student math growth and achievement</i>	To document improvements in math instruction and subsequent student growth and achievement

The timeline in Figure 16 provides a visual of which data collection instrument is being used at different parts of the Fellowship.

**Figure 2** *Data Collection Instruments and Timeline*



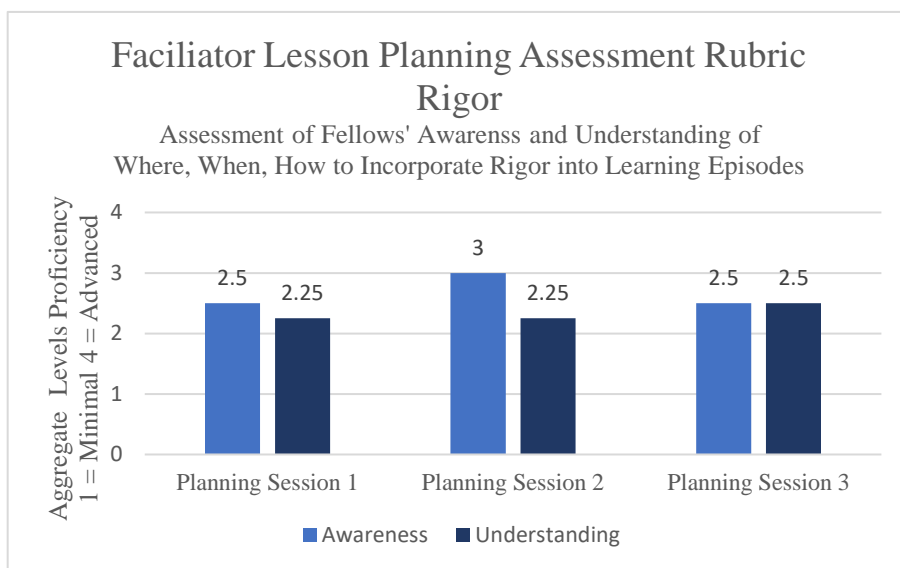
## Results

### Short Term Outcome Measures

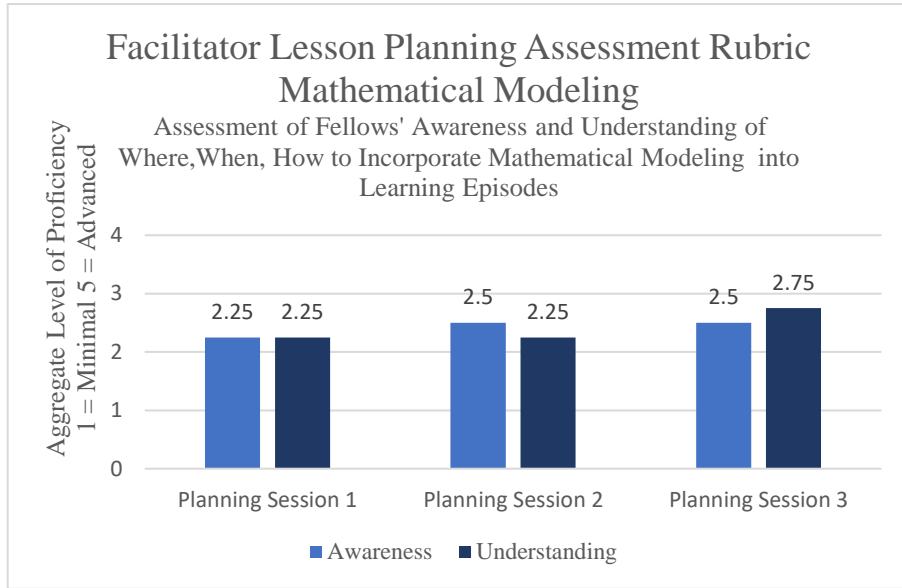
#### Facilitator Lesson Planning Assessment Rubric: Awareness and Understanding

The NNRPDP Mathematics Specialists evaluated the overall awareness and understanding the grade level groups exhibited during the Claim 4 (Mathematical Modeling) intentional planning sessions using the Facilitator Grade Level Lesson Planning Assessment Rubric (Appendix E). The groups' proficiency levels were evaluated for each of the following categories: rigor, Major Work of the Grade, mathematical modeling, productive discourse, productive struggle, and resources. The Mathematics Specialists' assessment of the Fellows' proficiency levels related to these categories were reported as an aggregate score by finding the mean of the Mathematics Specialists' assessment of proficiency by translating the descriptors to a Likert scale where 1 = minimal proficiency and 4 = advanced proficiency. Non-applicable ratings were not factored into the aggregate proficiency ratings where  $n=8$ . The results provided qualitative measures for four of the six variables: 1) increased levels of awareness, 2) increased measures of understanding, 3) increased ability to create lesson plans, and 4) increased ability to utilize instructional resources in relation to NVACS-M Major Works of the Grade and SBAC Claim 4 (Mathematical Modeling). These data are depicted in Figures 17, 18, 19, and 20.

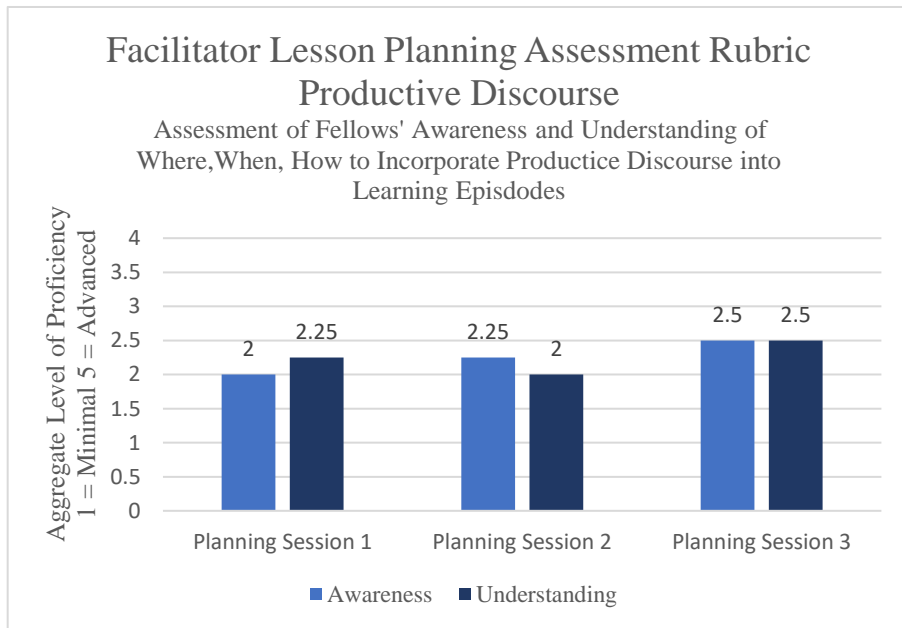
**Figure 3** Facilitator Lesson Planning Assessment Rubric: Rigor ( $n=8$ )



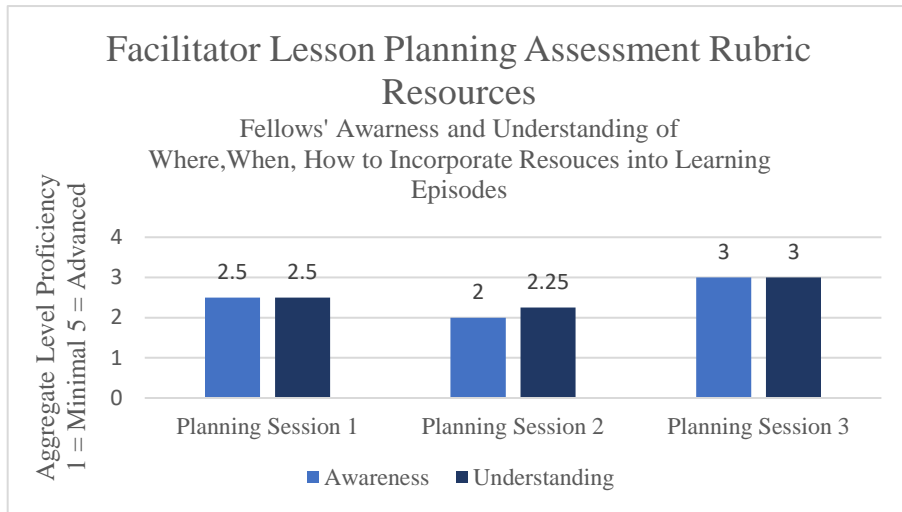
**Figure 4** *Facilitator Lesson Planning Assessment Rubric: Mathematical Modeling (n=8)*



**Figure 5** *Facilitator Lesson Planning Assessment Rubric: Productive Discourse (n=8)*



**Figure 6** *Facilitator Lesson Planning Assessment Rubric: Resources (n=8)*



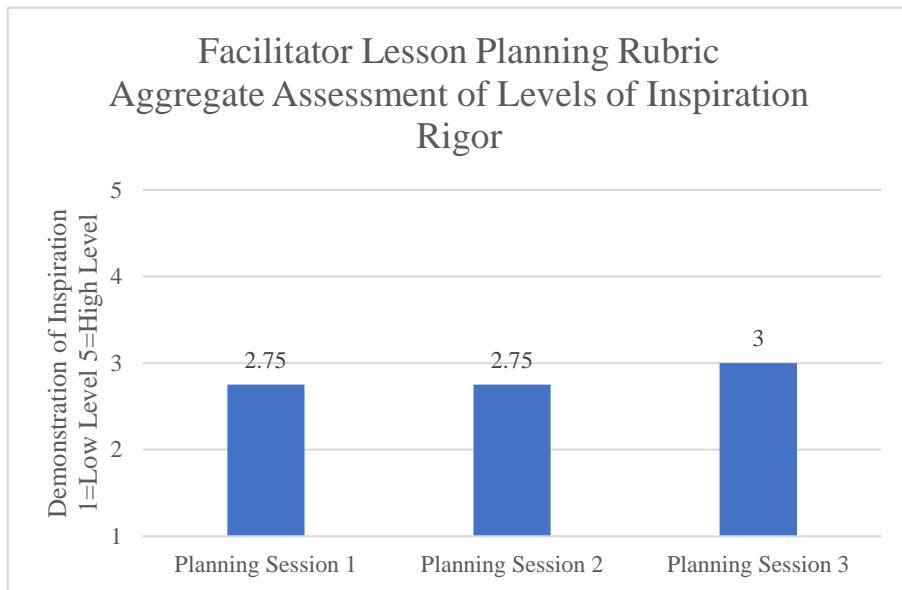
The aggregate ratings (n=8) for the six categories assessed during the three intentional lesson planning sessions fell below the proficiency level for all of the categories with the exception of awareness of the Major Work of the Grade. Given the variabilities that existed between the participants' lessons and foci within the context of the concepts addressed during the lesson planning sessions, growth trends in the Fellows' levels of proficiency were not readily apparent in the aggregate scores. The data obtained for these measures from the Facilitator Grade Level Lesson Planning Assessment Rubric may have also been impacted by a lack of rating consistency on the lower quartile of the proficiency scale. The Mathematics Specialists' debriefings suggested interpretations of the *non-applicable* rating varied. For instance, with regard to the measures related to awareness and understanding, one Mathematics Specialist might assess the absence of reference to discourse in a planning session as non-applicable whereas another Mathematics Specialist might assess it as an indication of a low level of proficiency. The inclusion of the non-applicable rating, along with the varied foci of the context of the lessons addressed in the planning session, may have had unintended impacts. These issues can be addressed in future Fellowships by eliminating the non-applicable rating and identifying specific indicators for each of the categories.

**Facilitator Lesson Planning Assessment Rubric: Levels of Inspiration**

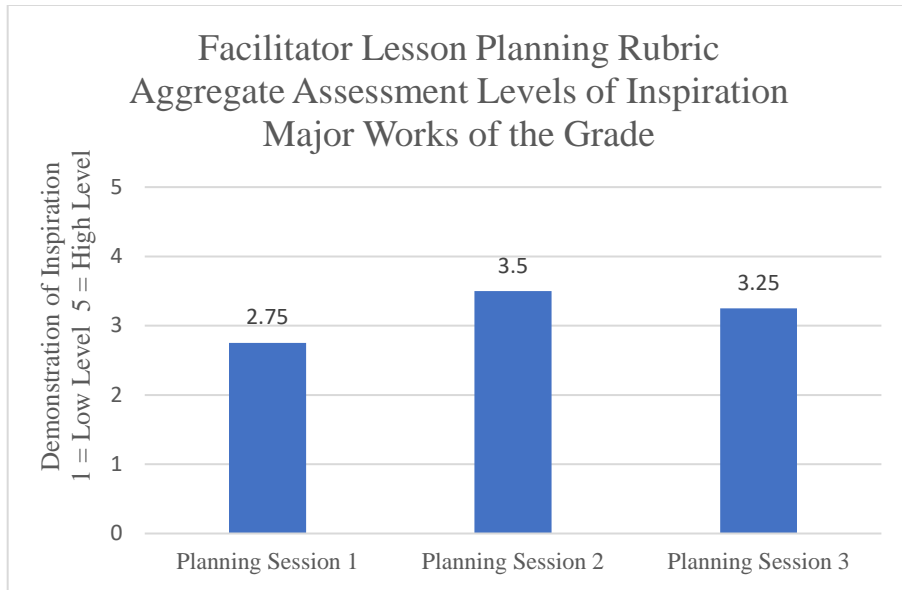
The NNRPDP Mathematics Specialists assessed the participants' general level of inspiration to intentionally focus on rigor, the Major Work of the Grade, mathematical modeling, productive discourse, productive struggle, and resources during the lesson planning sessions

using the Facilitator Grade Level Lesson Planning Assessment Rubric (see Appendix). The level of inspiration was intended to be interpreted as a demonstration of desire and excitement. For example, a fellow demonstrating a high level of inspiration for modeling might explicitly solicit support from the group on how to transform a computational exercise into a modeling opportunity. A fellow demonstrating a low level of inspiration for modeling might state they do not want to focus on incorporating opportunities for modeling into a lesson. The Mathematics Specialists' assessments of the groups' general level of inspiration were reported as an aggregate using a Likert scale where 1 referred to a low level of inspiration and 5 referred to a high level of inspiration with  $n = 8$ . These data are depicted in Figures 21, 22, 23, 24, 25, and 26.

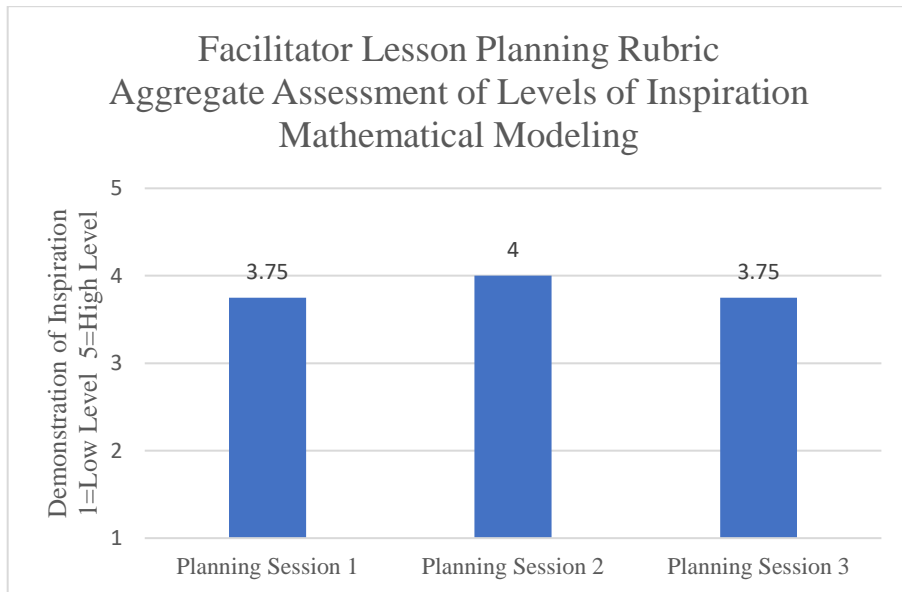
**Figure 7** *Facilitator Lesson Planning Rubric Aggregate Assessment of Levels of Inspiration: Rigor (n=8)*



**Figure 8** *Facilitator Lesson Planning Rubric Aggregate Assessment of Levels of Inspiration: Major Works of the Grade (n=8)*

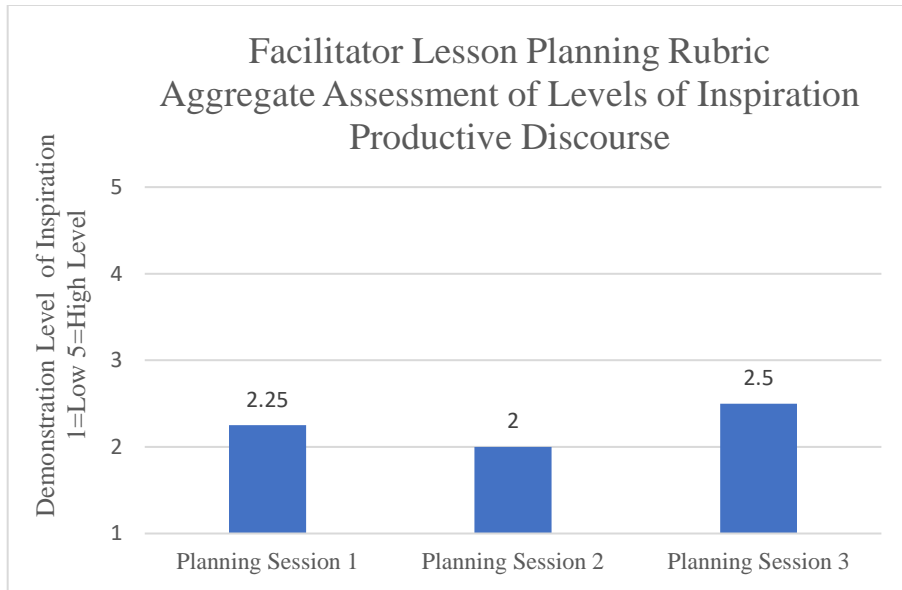


**Figure 9** *Facilitator Lesson Planning Rubric Aggregate Assessment of Levels of Inspiration: Mathematical Modeling (n=8)*

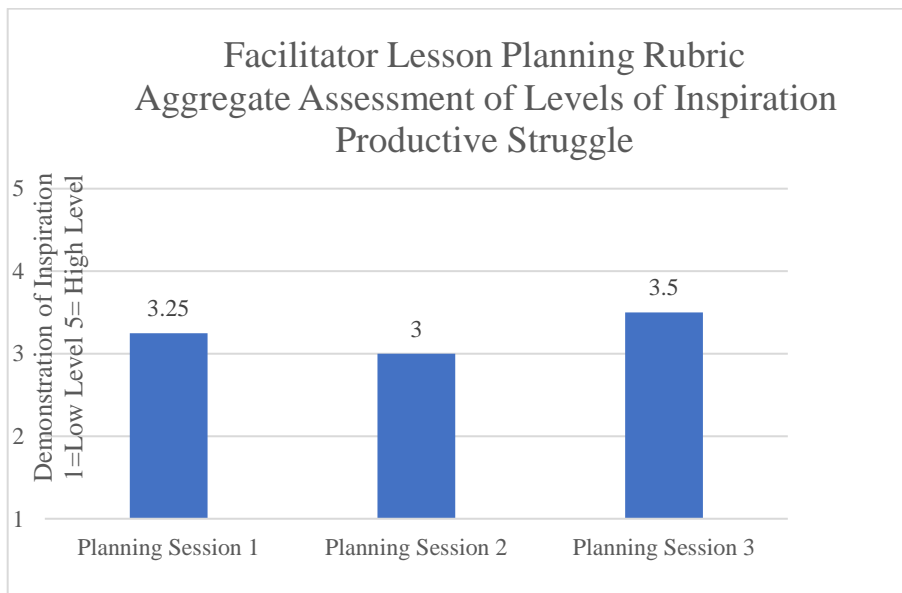


**Figure 10** *Facilitator Lesson Planning Rubric Aggregate Assessment of Levels of Inspiration: Productive Discourse (n=8)*

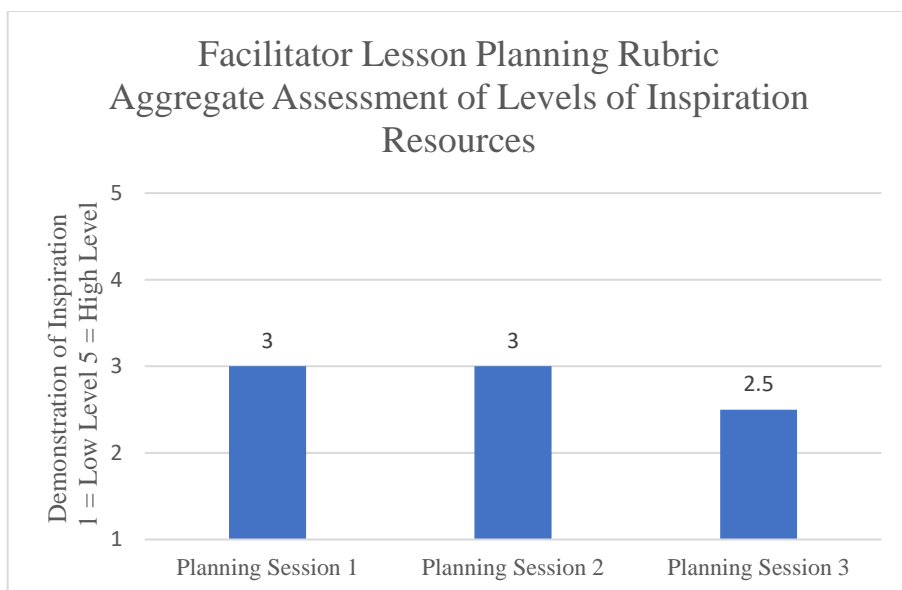




**Figure 11** *Facilitator Lesson Planning Rubric Aggregate Assessment of Levels of Inspiration: Productive Struggle (n=8)*



**Figure 12** *Facilitator Lesson Planning Rubric Aggregate Assessment of Levels of Inspiration: Resources (n=8)*

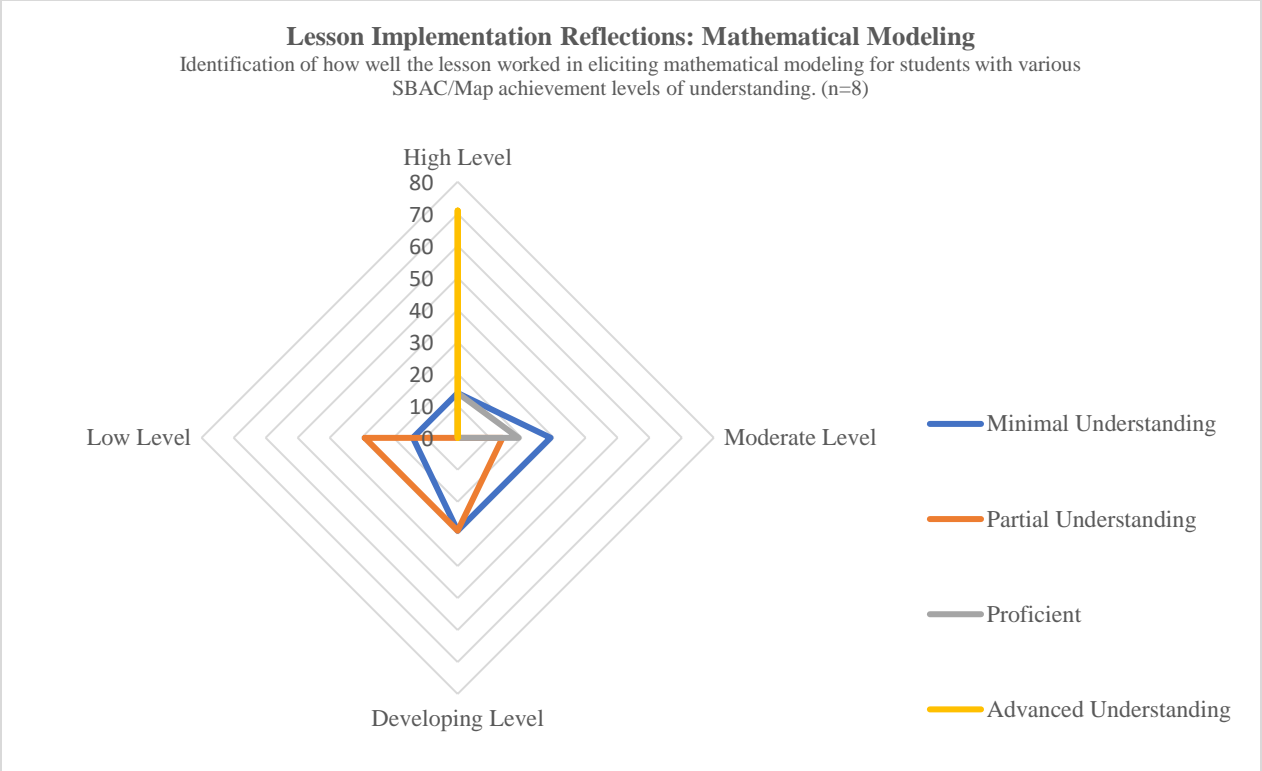


The aggregate levels ( $n=8$ ) of inspiration the Fellows exhibited for the Major Work of the Grade, mathematical modeling, and productive struggle generally fell above the mid-level range, whereas the ratings for rigor, productive discourse, and resources generally fell at or slightly below the mid-level range. An overview of all of these categories was conducted during the first Whole Group Session. In the following sessions, the whole group learning activities explicitly focused on mathematical modeling and productive struggle in contexts related to the inherent rigor associated with the Major Work of the Grades within the middle school grade band. Rigor, productive discourse, and resources were not explicitly addressed in the Whole Group Sessions outside of the overview in the first session. The Grade Level Lesson Planning Breakout Sessions implicitly focused on all of the elements as part of the lesson planning process with the explicit intention of incorporating opportunities for mathematical modeling. The higher levels of inspiration associated with the Major Work of the Grade, mathematical modeling, and productive struggle correlate with the primary and explicit content focus of the Whole Group sessions, which carried over into the lesson planning sessions. The level of inspiration was intended to be interpreted as a demonstration of desire and excitement. However, as with levels of awareness and understanding, one Mathematics Specialist might assess the absence of reference of an element in a planning session as non-applicable whereas another Mathematics Specialist might assess it as an indication of a low level of inspiration. The inclusion of the non-applicable rating, along with the varied foci of the context of the lessons addressed in the planning session, may have had unintended impacts on the lower quartile ratings of levels of inspiration. These issues can be addressed in future Fellowships by eliminating the non-applicable rating and identifying specific indicators for each of the categories.

### **Learning Episode Implementation Reflections**

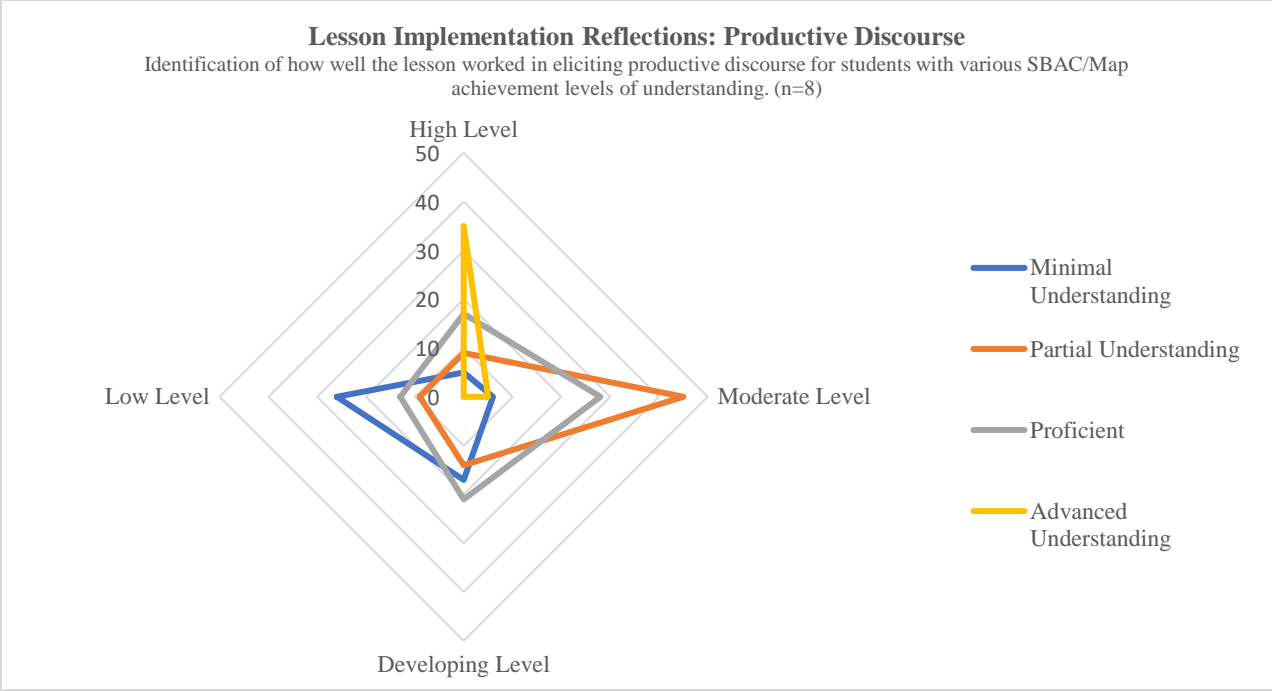
The Fellows completed Learning Episode Implementation Reflections (see Appendix E) following the debriefings of the implementation of lessons during the virtual sessions. The Fellows assessed the effectiveness of the lessons in terms of eliciting mathematical modeling, productive discourse, and productive struggle while also considering the relation to student proficiency levels based on SBAC/MAP data. The mean percentage ( $n=8$ ) of Fellows reporting a correlation for each of the 16 possible matrix options was tabulated for the three lessons. The measures were used to assess the variables: increased ability to implement lesson plans and the increased ability to assess student work in relation to NVACS-M Major Works of the Grade and SBAC Claim 4. These data are depicted in Figures 27 through 29.

**Figure 13** *Lesson Implementation Reflections: Mathematical Modeling ( $n=8$ )*



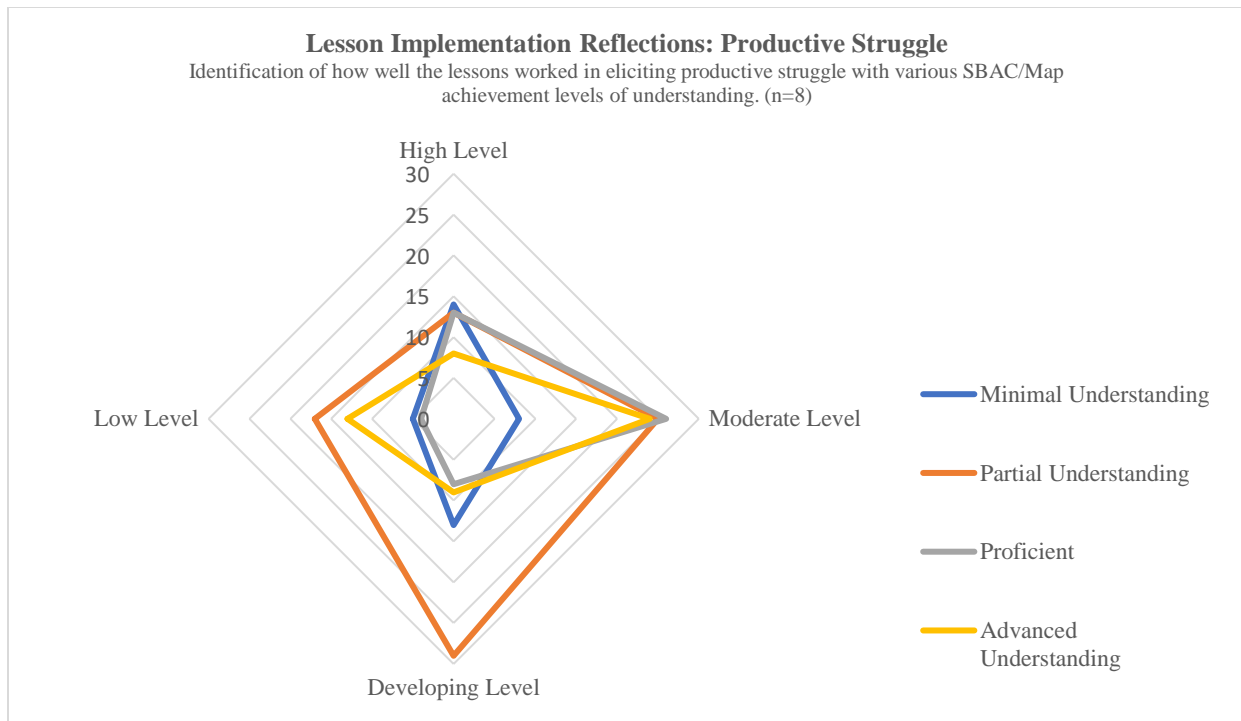
Fellows’ assessments of the level of mathematical modeling their lessons elicited in students rated as having an advanced achievement level on SBAC/MAP data typically fell in high range. Whereas the levels for students rated as having a minimal achievement level were distributed similarly in the upper and lower ranges. The data suggest students with advanced understandings more readily turned real-world contexts into something that could be manipulated with mathematics. The similar distribution among the upper and lower ranges for students rated as having a minimal understanding suggests the lessons provided entry points for students with different levels of understanding.

**Figure 14** Lesson Implementation Reflections: Productive Discourse (n=8)



Fellows’ assessments of the level of productive discourse their lessons elicited in students rated as having an advanced achievement level based on SBAC/Map data typically fell in the upper range. Whereas the levels for students rated as having a minimal achievement level fell in the lower range. The data suggests the capacity to engage in productive discourse may be related to and/or lead to greater levels of understanding and achievement. Thus, it may be worthwhile to continue to emphasize the relevance of productive discourse and further Fellows’ understandings of how to facilitate productive discourse in future Fellowships.

**Figure 15** Lesson Implementation Reflections: Productive Struggle (n=8)



Fellows' assessments of the level of productive struggle their lessons elicited in students rated as having an advanced achievement level based on SBAC/MAP data were distributed similarly in the upper and lower ranges with slightly more falling in the upper ranges. Students rated as having a minimal achievement level were distributed similarly in the upper and lower ranges with slightly more falling in the lower range. The data suggests the lessons provided entry points for students with different levels of understanding. An inference may be drawn that some students with an advanced understanding may have more readily accessed the content and did not necessarily need to engage in productive struggle, and some students with a minimal understanding may have struggled, but not productively.

While the degree to which each of the elements were elicited varied depending on the student proficiency levels, data suggests the Fellows' lessons elicited mathematical modeling, productive discourse, and productive struggle from students across all four levels of student proficiency at high levels.

Fellows' comments about which facets of the learning episodes they would implement or change in the future were analyzed for evidence of implementation of their learning. The number of comments made and the percentage of those comments including references to facets of the learning episodes that would be implemented or changed in the future were determined ( $n=8$ ). One hundred percent of the Fellows' reflections indicated implementation of learning.

Fellows' Quotes:

- *I will continue to try to incorporate activities that help students grow in their modeling skills and with communicating their results.*
- *The task provided for great discussions in the classroom. There were a variety of ways that students went about solving the problem. I would use the task overall again with modifications to the questioning.*
- *I will use the elicit productive struggle because with my Algebra 1 students they are used to math concepts being very easy and when I give them assignments where they struggle it causes them to use higher level thinking and solving skills.*

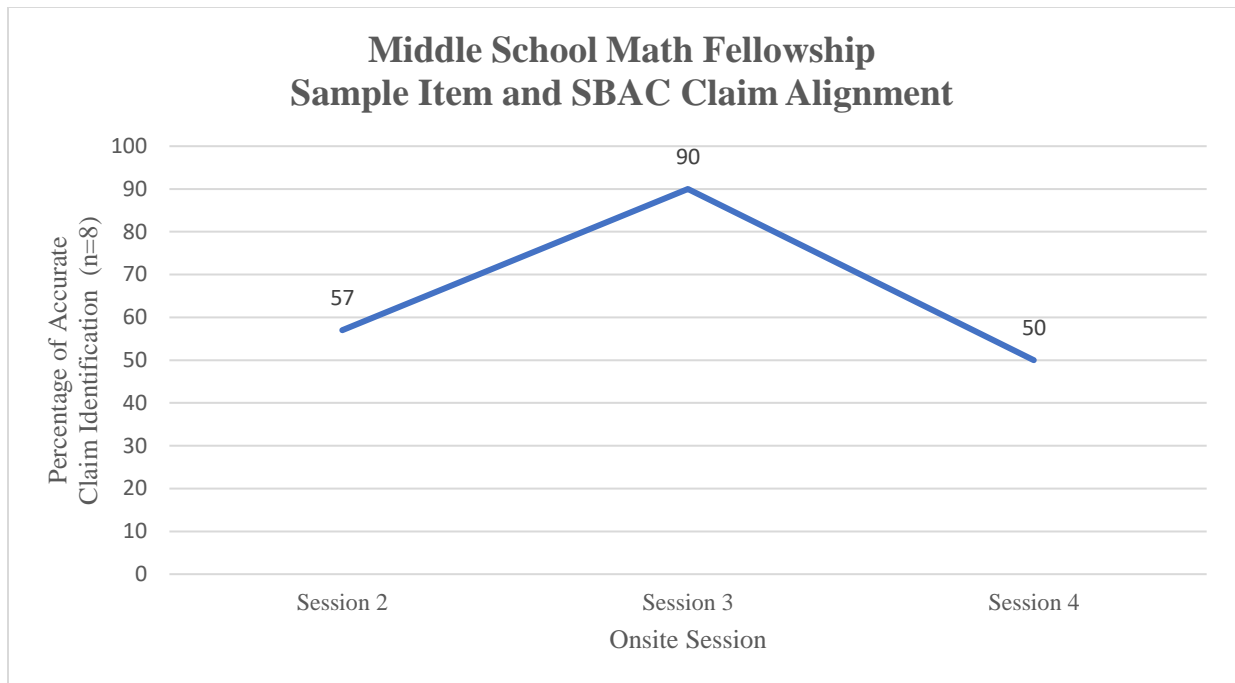
### **Student Work Rubric Analysis (Comparisons)**

After the debriefing of the learning episodes and analysis of student work samples in the Virtual Sessions, the Fellows and Mathematics Specialists individually assessed student work samples derived from the implementation of the lessons using the Smarter Balanced Mathematics General Rubric for 4-Point Items. The Fellows' assessment ratings ( $n=8$ ) correlated with the math specialists' assessment ratings on 94% of the submitted student work samples. The variables evaluated included: increased ability to assess student work in relation to NVACS-M Major Works of the Grade and SBAC Claim 4.

### **Sample Item SBAC Claim Alignment Identification**

Fellows' initial understandings of which SBAC Claim a sample item might best align with was assessed on the Pre-Survey (see Appendix) in Session 1. Increases in the Fellows' levels of awareness and understanding of SBAC Claim 4 were monitored in Sessions Two through Four using the Sample Item and Claim Alignment Assessment (see Appendix F). Fellows determined the best alignment of sample test items to the SBAC Claims at the beginning of Sessions Two through Four. After Fellows independently completed the Sample Item and Claim Alignment Assessment, the whole group debriefed the assessment. The percentage of accurate alignment identification ( $n=8$ ) over the three sessions was reported. The variable evaluated was the increased level of understanding in relation to SBAC Claims. See Figure 30.

**Figure 16** *Middle School Math Fellowship Sample Item and Claim Alignment*



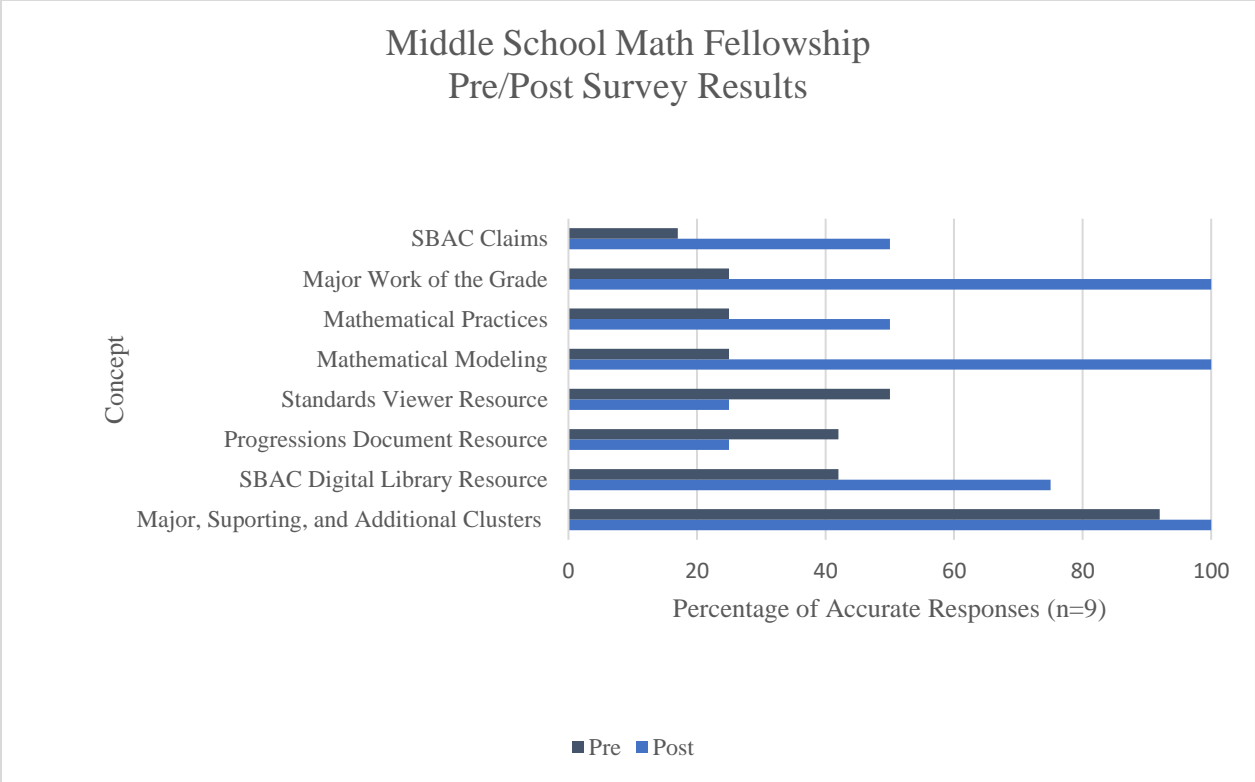
Although Fellows’ ability to accurately identify sample item alignment to SBAC Claims increased from Session 2 to Session 3, the percentage of accuracy dropped from Session 3 to Session 4. Due to the Fellows’ growing familiarity with the available sample items at the middle school level and their corresponding SBAC Claim classifications, it should be noted that a fifth grade sample item was selected as one of the sample items for Session 4. During a debrief of the items’ Claim alignments, it came to light some of the Fellows did not take note of the grade level on the fifth grade sample item and evaluated it as a Claim 2: Problem Solving item using the middle school lens. Due to the different nuances that exist between problem solving and mathematical modeling over the progression of concepts, the rationale provided by the Fellows was compelling and illustrated a level of awareness and understanding of the SBAC Claims. The awareness and understanding are also evident in the 33-percentage point increase ( $n=9$ ) in the Fellows’ accuracy rate for identifying SBAC Claim alignment with a sample item on the Pre/Post survey (see Appendix G) discussed next.

### Pre/Post Survey

To assess the variables of increased levels of awareness and increased levels of understanding in relation to NVACS-M Major Works of the Grade and SBAC Claim 4 and the increased ability to utilize instructional resources, a comparison of the percentage of the participants' accurate responses to the Pre/Post Survey Questions 2 - 9 (see Appendix H) were evaluated. See Figure 31.

**Figure 17** Middle School Math Fellowship Pre/Post Survey Results ( $n=9$ )





The number of accurate responses increased from the pre-survey to the post-survey for all measures with the exception of correctly identifying when to use the standards viewer resource and the Progression Documents. The greatest increase was in the Fellows’ awareness and understanding of mathematical modeling, which increased from 25% on the pre-survey to 100% on the post-survey ( $n=9$ ). The Fellows’ awareness and understanding of the use of the standards viewer resource and the Progressions Document declined by 25% and 17%, respectively, on the post-survey ( $n=9$ ). It was noted on one Fellows’ Pre-Test that the Fellow had guessed on the resources, which may have resulted in a greater percentage of accuracy on these two elements on the pre-survey than on the post-survey. The weight for one response has approximately 11% impact with the given sample size ( $n=9$ ). Surveys for future Fellowships will include an *I don’t know* response option in an effort to address such anomalies. Another factor impacting the results for these two elements was the varied foci of concepts addressed during the lesson planning sessions. This resulted in limited opportunities for in-depth explorations of the Progression Documents and the standards viewer resources as originally intended.

**Semi-Structured Interviews**

An external evaluator conducted semi-structured individual interviews with a randomly selected group of participants in the Fellowship. The qualitative data was used to assess the variables six variables: 1) increased levels of awareness, 2) increased levels of understanding, 3) increased ability to create lesson plans, 4) increased ability to implement lessons plans, 5)

increased ability to assess student work, and 6) increased ability to utilize instructional resources in relation to NVACS-M Major Works of the Grade and SBAC Claim 4.

The external evaluator was provided a list of names and email addresses of participants. They created numerical identifiers for each participant and selected five participants using the random number generator in Excel.

Of those five participants selected, three interviews were completed. Interviews were conducted through either web-based meetings or over the telephone.

Verbal responses are only included in this report if they are representative of a larger pattern of responses. In other words, the statements included are from one person, but they represent the opinions of multiple individuals. See Table 23.

**Table 4** *Semi-Structured Interviews Questions and Responses*

Variables	Increased level of awareness Increase level of understanding
Interview Question	What have been the biggest takeaways for you from the Math Fellows Professional Development program?
Response	<i>I always try to bring in real-world problems for my students, but I'm always frustrated. Some kids won't participate and resist thinking on their own. What I realized was that I was lining every step out too clearly. I was enabling them to not think. Now I'm understanding the value of productive struggle.</i>
Variables	Increased ability to create lesson plans Increased ability to implement lesson plans
Interview Question	In what ways have you implemented what you've learned in the classroom?
Responses	<i>[explained lesson, redacted for privacy]. So before this class, if I had done this lesson, I would have spoon fed the students the steps. Now I'm letting them figure things out for themselves for a while.</i>  <i>I think I already had a good understanding of SBAC, but I've really worked on increasing rigor and productive struggle in my classroom.</i>  <i>I've changed my whole curriculum to give kids experience with real problems. And I'm really thinking about rigor in a different way.</i>
Variable	Increased ability to assess student work

Variables	Increased level of awareness Increase level of understanding
Interview Question	How has this professional development impacted student learning in your classroom?
Responses	<i>I don't know yet, but I'm afraid there are a lot of other factors that are going to mess up my scores this year [went on to list, redacted for privacy]. What I do know is that this is all working well with my higher achieving students, but I'm still struggling to get my lower students to be comfortable not understanding something right away.</i>  <i>It has been more difficult with my lower achieving students.</i>  <i>My students have really stepped up. I always tell them they could enter problem/observation anywhere they want to in their lives.</i>  <i>Honestly, my students are not motivated to care. I'm not sure how to fix that.</i>

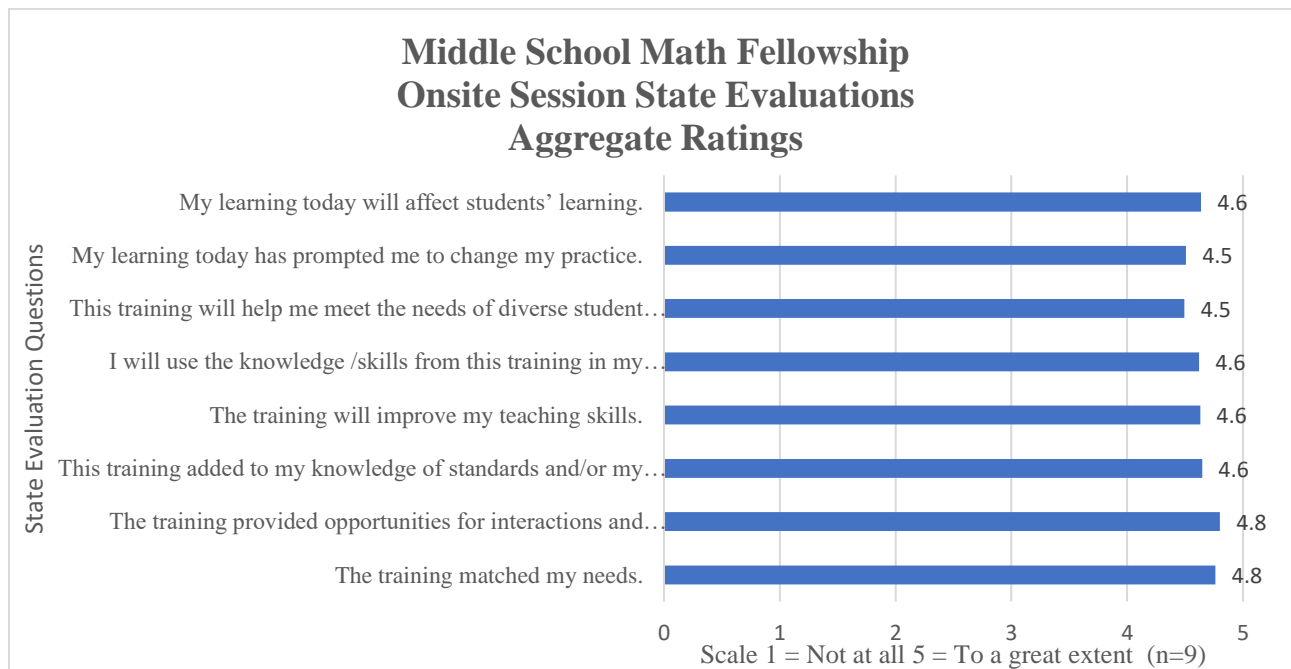
## Process Measures

### *Evaluations*

Methods to assess Fellows' reactions included data from State Evaluation surveys (see Appendix H). At the conclusion of each onsite session, Fellows completed the State Evaluation surveys. The NRPDP Mathematics Specialists used information from the State Evaluation surveys (see Figure 32) to monitor Fellows' reactions and make any necessary adjustments to future sessions. Evidence of impact on student learning and the incorporation of the awareness, understanding, implementation of concepts into instructional practice were documented using the Fellows' mean Likert scale ratings, ranging from not at all (one) to a great extent (five), of the following statements:

- The training met my needs.
- The training added to my knowledge of standards and/or skills in teaching subject matter and content.
- I will use the knowledge and skills from this training in my classroom or professional duties.
- My learning today has prompted me to change my practice.
- The Middle School Math Fellowship will help me meet the needs of diverse student populations (e.g., gifted and talented, ELL, special ed., at-risk students).
- My learning today will affect students' learning.

**Figure 18 Middle School Math Fellowship Onsite Session State Evaluations Aggregate Ratings**



Aggregate ( $n=9$ ) Likert scale ratings of the onsite sessions ranged from 4.5 to 4.8 indicating the Fellowship met the Fellows' expectations to a great extent.

Reflections from the State Evaluation optional comment section were analyzed in terms of references relating to impact on instructional design, instructional concepts, and instructional strategies. Eighty-four percent of the optional comments included on the evaluations suggested evidence of impact on instructional design, instructional concepts, and instructional strategies.

Excerpts from the State Evaluation Optional Comment Section:

- *I will take the lessons worked on and teach it to my students. I will also try to add more Claim 4 type of questions into my routine.*
- *I will understand the SBAC results and be better able to analyze math data.*
- *[ I will be transferring] getting kids into good discomfort state and being able to help move them out of it.*

### **Elements of Effective Professional Development Survey Data**

Fellows' reactions were also measured using qualitative data relating to the seven elements of effective professional development obtained from Fellows' State Evaluation survey comments ( $n=9$ ) and semi-structured interviews conducted by an outside evaluator ( $n=3$ ), as well as scale ratings ( $n=9$ ) from process measure question 11, on the post-survey (see Table 24; Appendix E).

**Table 5** *Fellows' Reactions to Effective Professional Development Elements*

Effective Professional Development Element	Fellowship Design: Element Evidence	Fellows' Reactions Interview Independent Evaluator Comments (n = 3) State Evaluation Comments (n = 9)
Content Focus	<p>The Fellowship's intentional focus on discipline-specific curriculum development and pedagogies is reflected in:</p> <ul style="list-style-type: none"> <li>• Focus on mathematical modeling and data analysis (SBAC Claim 4)</li> <li>• Focus on implementation of modeling and data analysis into instructional episodes</li> <li>• Focus on instructional resources</li> </ul>	<p><i>A constant theme of participants who were interviewed was discussion of how they were implementing modeling in the classroom throughout taking the class. Most participants interviewed sprinkled the interview with concepts and words directly from the course, including: productive struggle; rigor; and, modeling as they explained implementation.</i> (Interviewee Comment, Independent Evaluator)</p> <p><i>I will begin to look for more application based questions and modify questions to pique more interest in math tasks.</i> (Fellow Comment, State Evaluation)</p>
Active Learning	<p>The opportunity for engagement in active learning in the Fellowship is reflected in:</p> <ul style="list-style-type: none"> <li>• Mathematical modeling lessons model by NNRPDP mathematical specialists</li> <li>• Model lesson analysis</li> </ul>	<p><i>Common theme: "We would learn something, go two weeks and try in classroom, connect with our group in Zoom, and then go back to class. It was helpful to revisit these concepts in different settings and discuss."</i> (Interviewee Comment, Independent Evaluator)</p> <p><i>Great job today! I enjoyed every activity!</i> (Fellow Comment, State Evaluation)</p>

Effective Professional Development Element

Fellowship Design: Element Evidence

Fellows' Reactions  
Interview Independent Evaluator  
Comments (n = 3)  
State Evaluation Comments (n = 9)

*I want the answers to the rope problem haha [sic] (Fellow Comment, State Evaluation)*

Collaboration

The creation of space for sharing ideas and collaboration in the Fellowship is reflected in:

- Model lesson analysis
- Content learning
- Planning learning episodes
- Debriefing learning episodes
- Analyzing student work

*Participants who were interviewed consistently mentioned their appreciation for being able to discuss and practice concepts with their cohorts and facilitator. (Interviewee Comment, Independent Evaluator)*

*The opportunities to interact as professionals and discuss their content area and practice is valuable! (Fellow Comment, State Evaluation)*

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Models of Effective Practice

The modeling of effective practice in the Fellowship is reflected in:

- Model lessons
- Learning episode planning considerations and resources content and organizers
- Learning episode planning
- Student work analysis

*I enjoyed the day. Thank you for sharing your knowledge and expertise. (Fellow Comment, State Evaluation)*

*I will start to turn more questions into modeling practices. (Fellow Comment, State Evaluation)*

*I wanted to let you know that it was a great session today!! ...I absolutely loved the way you really made the teachers stretch in their thinking and their responses! Taking a careful look at student work is such an important way of reflecting on our teaching. (Fellow*

Effective Professional Development Element

Fellowship Design: Element Evidence

Fellows' Reactions  
Interview Independent Evaluator  
Comments (n = 3)  
State Evaluation Comments (n = 9)

Comment, Personal Email Communication)

Coaching and Expert Support

The sharing of expertise and best practices targeting individual needs in the Fellowship is evidenced by:

- Learning episode planning
- Student work analysis
- Individual supports offered outside of the official sessions via classroom visits, emails, and/or virtual meetings

*Common themes: "NNRPDP shows you resources so you can go look it up if you have a problem or question. And they are always there to ask and they know what they are doing. I feel like I can call them even now [after the class] if I had a question"*

*"It was really great seeing student work from other teachers and analyzing together. It helped bring all the pieces together."*

*"I find myself getting my book out [from the class] all the time when I'm planning lessons. It reminds me to follow the steps, like predict where students will struggle and plan for that." (Interviewee Comments, Independent Evaluator)*

Feedback and Reflection

The facilitation of reflection and solicitation of feedback in the Fellowship is reflected in:

- Model lesson analysis
- Content focus debrief
- Learning episode planning

On a scale of "not at all" to "a great extent," 100% of the Fellows indicated sufficient resources were made available to a *great extent* to support their implementation of the learning, i.e. mathematical modeling information and examples, collaboration, feedback, time

Effective Professional Development Element	Fellowship Design: Element Evidence	Fellows' Reactions Interview Independent Evaluator Comments (n = 3) State Evaluation Comments (n = 9)
	<ul style="list-style-type: none"> <li>• Learning episode debrief</li> <li>• Student work analysis</li> </ul>	<p>for sharing, time for reflection (Post Survey)</p> <p><i>I am looking forward to working in grade level bands to apply what we are learning.</i> (Fellow Comment, State Evaluation)</p>
Sustained Duration	<p>Adequate time to learn, practice, implement, and reflect is evidenced in the Fellowship by:</p> <ul style="list-style-type: none"> <li>• Ongoing over two academic school years</li> <li>• Multiple sessions offered during school years</li> </ul>	<p><i>Participants were asked about the pacing and organization of the course and there were no negative comments. In addition, every participant mentioned their plans to implement lessons in the future.</i> (Interviewee Comment, Independent Evaluator)</p>

### **Guskey's (2002) Professional Development Evaluation: Organizational Support and Change**

To assess process measures related to Level 3, Organizational Support and Change (Guskey, 2002), Fellows were asked on the post-survey to what extent they felt supported by their school site and/or district administration when implementing their learning. Twenty-five percent of the Fellows felt “somewhat supported,” 50% felt “moderately supported,” and 25% felt “greatly supported” (n=8). The third-party independent evaluator identified themes indicated in Fellows’ responses (see below) to the question: *In what ways has this professional development changed your feelings about being a teacher?* (n=3)

#### Fellows’ Responses:

- *This made me feel better. Like I have more options to actually help my students.*
- *What I learned is that I need to stick with a pacing guide. I have to slow myself down from implementing every new thing I learned. I’m using the resources from NNRDPDP.*
- *I reflect on my teaching all the time. I always want to get better and serve my students.*



- *I am focusing my energy to implement new things, difficult to keep it all organized.*

## **Discussion**

### **Short Term Outcome Measures**

Evidence suggests the NNRPDP's objective to increase the level of the Fellows' awareness and understanding of NVACS-M Major Works of the Grade was achieved. Fellows' 4.6 mean rating from the State Evaluation data indicates the Fellowship added to the Fellows' knowledge of the standards to a great extent. The percentage of accurate responses assessing awareness of the NVACS-M Major Works of the Grade increased from 25% to 100% on the Pre/Post Survey. The Mathematics Specialists rated the Fellows as proficient in awareness and understanding of the Major Works of the Grade on the Facilitator Grade Level Lesson Planning Assessment Rubric.

Evidence suggests the NNRPDP's objective to increase the level of the Fellows' awareness and understanding of Claim 4 (Mathematical Modeling) was achieved. The percentage of accurate responses assessing understanding of the SBAC Claims increased by 33 percentage points on the Pre/Post Survey. Although Fellows' ability to accurately identify SBAC Claims declined from Session 3 to Session 4 on the Sample Item SBAC Claim Alignment measure, the debrief with the Fellows indicated awareness and understanding of the SBAC Claims. Qualitative data from the semi-structured interviews and survey comments further supports that Fellows' awareness and understanding of SBAC Claim 4 increased.

One-hundred percent of the Fellows' comments in the Learning Episode Implementation Reflections included evidence of learning and use of new knowledge and skills. The Fellows' and the Mathematics Specialists' assessments of student work using the SBAC Mathematics Rubric for 4-Point Items matched on 94% of the student work samples, suggesting the student work analyses impacted Fellows' ability to align assessments with SBAC expectations. However, NNRPDP's objective to increase Fellows' ability to create and implement lesson plans to include SBAC Claim 4 was not met to the extent envisioned. The Mathematics Specialists' assessment ratings of the Fellows' understanding of how, when, and where mathematical modeling is best applied within lesson planning increased from Planning Session 1 to Planning Session 3. However, the Mathematics Specialists' debriefings suggest the Fellows were still in the process of developing their proficiency at designing and/or modifying lesson episodes to include opportunities for mathematical modeling.

NNRPDP's goal for Fellows to demonstrate the ability to create and implement lessons intentionally planned to elicit mathematical modeling, discourse, and productive struggle was not met to the extent envisioned. The Learning Episode Implementation Reflection data indicated mathematical modeling, productive discourse, and productive struggle was elicited at a high level for the range of student proficiency levels. The Fellows' self-reporting in the State

Evaluation, surveys, and semi-structured interview data also indicated an increase in ability to create and implement lessons intentionally planned to elicit these elements. However, data from the Facilitator Grade Level Lesson Planning Assessment Rubric indicated the Fellows were still developing proficiency creating lesson plans intentionally designed to elicit all three elements.

Evidence suggests the NNRPDP's goal to increase the ability to assess student work was met. The correlation of the rubric scores that existed between the Fellows' assessments of student work samples and the mathematics' assessment of the student work samples was notable. Qualitative data from surveys and semi-structured interviews also indicate an impact on the Fellows' ability to assess student work.

The complexity of rigor includes awareness and understanding of the Major Works of the Grade and the targeted depth of knowledge assessed through the SBAC Claims. NNRPDP's ongoing goal is to support Fellows to create rigorous instruction based on NVACS-M. The progression toward strengthening instructional practice by increasing rigor is evident in Fellows' increased awareness and understanding of the Major Works of the Grade and SBAC Claim 4 illustrated by the Facilitator Lesson Planning Rubric Assessment, the Fellows' Learning Episode Reflection, Claim Identification Assessment, Pre/Post Survey, and Semi-Structured Interview data. The Facilitator Lesson Planning Assessment Rubric data indicates the Fellows are developing understandings and awareness of rigor. Fellows' competency assessing the depth of knowledge and understanding related to the Major Work of the grade is evident in the Fellows' assessments of student work using the SBAC Mathematics Rubric for 4-Point Items matching the Mathematics Specialists assessments on 94% of the student work samples.

NNRPDP's goal for Fellows to demonstrate an increased ability to utilize resources, such as the Digital Library, Progression Documents, and standards viewer to improve teaching practices was not met to the extent envisioned. Data from the Facilitator Grade Level Lesson Planning Assessment Rubric and debriefing reports from the Mathematics Specialists' debriefings indicate Fellows' awareness and understanding of these resources as partially proficient. Data from the post-survey did not indicate an increased awareness of the resources. No references to the resources were identified in the Learning Episode Implementation Reflections. However, two of the Fellows did use resources obtained from the Digital Library during the planning sessions, and 100% of the Fellows did note the Fellowship provided resources in the post- survey. In addition, resources were specifically referenced in 67% of the semi-structured interviews.

### **Long term measures**

The long term goal of the Fellowship was to deepen understandings of student achievement targets outlined by SBAC in order to strengthen instructional practices. The long term measures of the NNRPDP to increase student learning and growth as measured by

aggregate assessment scores and those scores compared to a comparison group was not accessible for the 2019-2020 academic year. Due to the Covid-19 pandemic these end-of-year state assessments were suspended.

## **Process Measures**

The mean Likert scale ratings from the State Evaluation ranged from 4.5 to 4.8 suggesting the sessions met Fellows' expectations and were perceived as useful. The feedback and comments on the evaluations, survey data, and semi-structured interviews further suggests the process measures were achieved and Fellows' were satisfied with the Fellowship.

## **Conclusion**

Evidence suggests the NNRPDP achieved three of the objectives outlined for the Fellowship and three objectives were not met to the degree envisioned. Two of the objectives that were met, increased awareness and understanding of NVACS-M Major Work of the Grade and Claim 4 (Mathematical Modeling), were connected to the Whole Group Sessions, while the other objective, increasing the ability to assess student work in relation to the NVACS-M Major Work of the Grade and Claim 4 (Modeling), was primarily addressed during the Virtual Sessions. The three objectives that were not met to the extent envisioned, creating lesson plans, implementing lesson plans, and utilization of the resources, i.e. Digital Library, Progression Documents, and standards viewer, were associated with the Grade Level Lesson Planning Breakout Sessions.

Unforeseen barriers may have hampered the level of achievement of the Fellowships' objectives and goals related to the Grade Level Lesson Planning Breakout Sessions. The Grade Level Lesson Planning Breakout Sessions were initially structured for Fellows to co-plan one lesson in grade level teams with all grade level Fellows implementing the same intentionally planned lesson in their respective classrooms. The lesson implementation would be debriefed in grade level teams in the Virtual Session. The Virtual Session would also include the analysis of the student work samples derived from the implemented lesson. The structure was based on the lesson study model. Barriers resulted in the need to augment the structure for the Grade Level Lesson Planning Breakout Sessions and follow up Virtual Sessions.

Since Fellows were from different districts and school sites, not all Fellows were using a similar pacing schedule. Fellows were not addressing the same standards during the same time frames, and some Fellows were required to teach the adopted curriculum without deviation. With input from the Fellows, adjustments were made to the lesson planning sessions in order to address these barriers. Instead of co-planning one lesson, Fellows shared a self-selected lesson they would implement and solicited feedback from the group on how to make modifications to the lessons to incorporate mathematical modeling, increase rigor, and/or provide opportunities for productive discourse and productive struggle.

The modification to the original lesson study format drastically reduced the depth to which intentional planning could occur, and it limited the amount of time that could be devoted to providing each of the Fellows feedback about their self-selected lessons. As a result of unforeseen life events, some Fellows were not able to complete the Fellowship. This resulted in the need to combine Fellows from two different grade levels, sixth and seventh. The need to combine groups impacted the ability to focus solely on the Major Works of the Grade of one specific grade level, serving to further limit the depth of the intentionality of the lesson planning. Given that not all Fellows were analyzing work samples from the same lesson during the virtual sessions, the analyses were hindered. The group did not share the same level of understanding of the context of each other's lessons as they would have had they all delivered the same lesson.

Upon reflection, the Mathematics Specialists determined the Grade Level Lesson Planning Breakout Sessions focused on too many elements, which impacted achievement of the goals related to intentional planning and implementation of lessons. Planning to intentionally increase rigor levels while incorporating opportunities for mathematical modeling, productive struggle, and productive discourse using the dense resources resulted in too many foci for the Fellows. Thus limiting the necessary depth of understanding of each element to proficiently incorporate each element into the lessons. Future Fellowships will focus on fewer elements leveraging insights gained from the Year 2 data, such as emphasizing opportunities to elicit productive discourse in instructional practice.

Modifications to the structure of the Fellowship are necessary to achieve the goals related to intentional planning and implementation of lessons. To address the barriers in future Fellowships, the lesson planning sessions will be structured where Fellows will help one fellow intentionally plan a learning episode. Having groups of Fellows plan just one lesson during a session will allow space for depth of understandings to develop. The debriefings of these group planned lessons will include Fellows observing the implemented lesson either in person or via video and an analysis of student work derived from students in the presenting Fellow's classroom. Fellows will be able to transfer learnings from the group planning and lesson debriefing sessions to their own instructional practice when designing lessons independently. The number of foci will be limited to one or two elements, which the Fellows will identify as areas of need, in order to achieve the necessary depth of understandings required for intentional planning. Making these structural changes to the lesson planning session will likely strengthen the Fellowship's lesson planning sessions, improve the likelihood of transfer to practice, and promote positive shifts in instruction.

The Mathematics Specialists intention and hope is to sustain ongoing professional development by offering a third year of the Fellowship. The Mathematics Specialists want to expand the positive impacts of Fellowship in the region by increasing the number of Fellows in

Year 3. Increasing the number of Fellows will provide greater opportunities to analyze results for statistical significance. The Mathematics Specialists will continue to refine the Fellowship, building on the learnings from Year 1 and Year 2. These adjustments will better support Nevada's mission to improve student achievement and educator effectiveness by ensuring opportunities, facilitating learning, and promoting excellence.

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