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Enhanced Learning Maps Project
Year 3 Evaluation Report

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Executive Summary

The Enhanced Learning Maps (ELM) project is funded with a four-year U.S. Department of Education Enhanced Assessment Grant. The Center for Assessment and Accountability Research and Design (CAARD) coordinates the project and it is administered by the Kansas State Department of Education. Additionally, three other state education agencies (SEAs) are collaborating on the project. Those SEAs include the Alaska Department of Education, the Missouri Department of Education, and the Wisconsin Department of Public Instruction.[1]

The goal of the ELM project is to produce learning maps for individual mathematics and English language arts standards and coherent groups of standards to help teachers plan instruction that is sensitive to cognitive development. McREL International was hired as a third-party evaluator to gather data and report on the project's implementation and outcomes. This Year 3 evaluation report encompasses October 2017 to September 2018 and focuses primarily on the project's implementation from the perspectives of the teacher participants, partners and project staff. Perceptions of impact on instructional practice are also provided. The following conclusions and recommendations are drawn from a comprehensive review of the findings.

Conclusions

Conclusions are organized around six areas, which align to the primary areas evaluated. Those areas include recruitment; implementation; impact on instructional practice; state-level trainings; communication and collaboration; and sustainability, scale-up, and replication.

Recruitment

In Year 3, state trainings were held in each of the four states. It was expected that each state would recruit 100 educators to participate.

- State partners and project staff agreed that recruiting teacher participants has been a primary challenge, in part because of the "word of mouth" recruiting strategy, multiple initiatives occurring for one state which required demands on teachers' time, and changes in personnel in some states.
- Project staff suggested that creating and maintaining clear lines of communication with state partners would help future projects with recruitment efforts. They also recognized the vital work done by state partners in reaching the targeted number of participants.

[1] The Iowa Department of Education was originally a partner but discontinued participation in Spring 2017.

Implementation

During the 2017-18 school year, Cohort 1 educators continuing their participation in the project (trained in Summer 2016) and Cohort 2 participants (trained in Summer 2017) implemented the units and provided feedback to ELM project staff on their experiences in using the ELM resources and maps. ELM project staff continued to develop and refine ELA and math units and the maps based on participant feedback.

- Project staff who were familiar with the original proposal agreed that the project is being implemented as planned and, in some cases, better than anticipated. State partners also agreed that implementation had gone as expected in their states.
- The majority of teachers reported implementing two or three units. ELA teachers were more likely than math teachers to report teaching six or more units. The most common reason for not implementing more units were time constraints, alignment to district-adopted curriculum, and lack of content.
- Of the resources that were included in the units, teachers reported using the Student Activity, Instructional Activity Handout, and Instructional Activity most often. Least often used was the Student Locater Tool.

Impact on Instructional Practice

The intent of the ELM project is to improve the participating teachers' ability to provide personalized instruction by supplying them with resources (maps and units) they need to implement effective formative assessment practices.

- The ELM project impacted Cohort 1 and 2 teachers' instructional practices by assisting them in introducing new concepts, providing instruction in specific topic areas, and aiding lesson planning. Teachers also used the ELM materials and learning maps to shift from teacher-directed to student-directed learning, in which they asked more questions, listened more closely, questioned students' reasoning, and let students guide their own learning.
- Cohort 1 and 2 participants used the ELM materials and learning maps to adjust their instructional practice to identify students' misconceptions, help students reach learning targets, address gaps in students' understanding, and identify where their students are in their learning and what they should learn next.
- The summer training presentations increased teachers' knowledge of tools they can use for formative assessment, including listening to and questioning students more frequently during instruction, and increased their capacity to assess students' learning and determine next steps.

State-Level Trainings

In the project's third year of operation, the focus was on large-scale use and providing access to ELM resources to more teachers in each of the participating states. Towards this end, two-day trainings were held in each of the four states.

- Cohort 3 and returning Cohorts 1 and 2 participants rated the presenter quality, materials, and content of the summer 2018 state-level trainings very highly. They also said that the objectives were clear; the training provided information and resources that can be accessed for future use; and the information was of high quality, relevance, and usefulness.
- Training participants found the process of going over the maps and the maps themselves, as well as the units and accompanying resources, to be the most helpful aspects of the summer trainings. They also appreciated the responsiveness and helpfulness of the ELM presenters and staff.
- Most participants reported that they would like to use the ELM software frequently and that the functions of the software are well integrated. Furthermore, only a small percentage of participants indicated that they thought they would need technical support to use the software.

Communication and Collaboration

The ELM project staff consists of three primary teams: leadership, research/content, and technology. The project is implemented in collaboration with four state education agencies and guided by the project's Governance Board.

- Project staff reported that they communicate and collaborate with each other in a variety of ways, including biweekly and weekly meetings, email, and online or face-to-face conversations. Some staff reported inconsistencies in the quality of this communication, in particular between members of the leadership team and the research/content and technology teams.
- Project staff indicated that there was room for improvement in communication and collaboration with state partners. Conversely, state partners were universally pleased with their collaboration and communication with the ELM project staff. They suggested that an added focus on timeliness could only enhance this collaboration.
- Project staff were divided in their perceptions of the degree to which input from state partners and Governance Board members is taken into consideration. Some staff indicated that suggestions from state partners are weighed too heavily, while others suggested that they did not affect the project and were appropriate to incorporate.

Sustainability, Scale-up and Replication

By the end of the four-year grant, the ELM project staff intends to have resources and strategies that will be sustainable and able to be replicated.

- ELM project staff and the states have begun discussions about the sustainability of the ELM project following the cessation of the Enhanced Assessment Grant funding. The resources will be available as open source, though it has not yet been determined how or where the software will be hosted (i.e., individual states' or districts' servers, the University of Kansas [KU], or a commercial site).
- Concerns were shared by both ELM project staff and state partners about the support and training needed to sustain and scale-up the use of the maps and resources following Year 4, and that support systems and plans for updating project materials are critical for successful continued use.

Recommendations

Based on the findings and conclusions, the following recommendations are provided for ELM project staff to consider in the project's final year of implementation. Recommendations are organized by four areas: recruitment; implementation; communication and collaboration; and sustainability, scale-up and replication.

Recruitment

- Although recruitment will not be a part of the final year of the project, there are some lessons learned that can be applied to any similar future projects, i.e., clearly communicate at the onset partner expectations with regard to participant recruitment and give appropriate and timely attention to recruitment at partner meetings (several months in advance of when recruitment needs to occur).
- Likewise, where there are changes in state partner representation, consider having individual meetings with the new state contact to discuss project expectations and respond to any questions.

Implementation

- Continue to be adhere to what was proposed in the grant application. At this point, the ELM project has been implemented as proposed and to some extent has gone beyond its original scope in order to better meet state and teacher needs. Although this is a positive, it should be balanced to ensure that any additional activities can be completed within the allocated budget without interfering with the effort and resources that were originally allocated to accomplish the proposed scope of work.
- Continue to provide support to the teachers as they use the maps and implement the units. The ongoing modes of support, although not necessarily optimally utilized, are valued by the teachers who have requested assistance.

Communication and Collaboration

- To ascertain the impact on instructional practice and student learning (the focus of the Year 4 research) it is critical that teachers are implementing the units, using the map, and reporting on its usage. Consider developing a communication plan (i.e., strategies, timeline, methods) for monitoring teacher involvement and usage data collection.
- Consider how partners can be involved in Year 4 to promote full participation for Cohorts 1-3. Without ongoing communication and encouragement, it is less likely teachers will follow through with project expectations.
- Similar to the implementation recommendations, ensure regular communication with teachers and continue to provide support to aid in continued engagement in the ELM project.

Sustainability, Scale-Up and Replication

- Continue to work directly with state partners and school districts to gather feedback on the best way to sustain and scale up the ELM project in each state, including developing plans for the transfer of the software to the appropriate server(s).
- Facilitate a discussion or series of discussions with state partners and/or Cohort 1 and 2 teachers on the successes and challenges they faced in implementing the ELM project. Utilize this information to develop a document detailing how the Enhanced Learning Maps and resources could be used by other districts, schools, and teachers.

Introduction

The Enhanced Learning Maps (ELM) project is funded by a four-year U.S. Department of Education Enhanced Assessment Grant. The Center for Assessment and Accountability Research and Design (CAARD) at the University of Kansas (KU) coordinates the project, which is administered by the Kansas State Department of Education. Additionally, three other state education agencies (SEAs) collaborate on the project: the Alaska Department of Education, Missouri Department of Education, and the Wisconsin Department of Public Instruction.[2]

The goal of the ELM project is to produce learning maps for individual mathematics and English language arts (ELA) standards and coherent groups of standards to help teachers plan instruction that is sensitive to cognitive development. Since the project's inception, ELM project staff have been developing resources for the learning maps. The development and refinement process will continue through the duration of the project. The learning maps are accompanied by written and some selected video-recorded descriptions explaining the nodes and connections in each map. For each learning map, ELM project staff generate an instructional activity and teacher's guide, providing a sample of how to draw out knowledge and target the nodes in the learning map. ELM project staff have also developed student locater tools for teachers to administer as pre and post assessments to generate the individual student data they need to address student's individual learning needs.

Beginning in spring 2016, ELM project staff and state partners recruited English language arts (ELA) and mathematics elementary and middle school teachers to participate in the project (i.e., Project Year 1). A total of 43 teachers (25 ELA teachers and 18 mathematics teachers). were invited to participate in what is referred to as Cohort 1. Cohort 1 teachers participated in a three-day workshop in Kansas City held July 6–8, 2016. The teachers received training on how to access the online ELM materials and how to use the materials in instruction. Following the training, the teachers were expected to continue to explore the ELM online interface and its tools, implement those tools in instruction, and complete feedback surveys at the end of each instructional unit. The intent was that teachers would implement six instructional units in ELA or math. ELM staff provided ongoing support through the 2016–17 school year (i.e., Project Year 2) as the teachers implemented the ELM resources.

The following year (i.e., spring 2017, Project Year 2), 57 teachers (21 ELA teachers and 36 mathematics teachers) were invited to participate in Cohort 2. In addition, 25 Cohort 1 teachers (11 ELA teachers and 14 mathematics teachers) opted to continue participating in the project. A three-day workshop for Cohort 1 and 2 teacher participants was held in Kansas City on June 20–22, 2017. The teachers received training on how to access the learning map software, the online ELM resources, and how to use the materials in instruction. Expectations of teacher participants were mirrored those of the previous year (i.e., implementing ELM units and providing feedback).

[2] The Iowa Department of Education was originally a partner and discontinued participation in Spring 2017.

In the ELM project's third year of operation (2017–18), the focus was on large-scale use and providing access to ELM resources to more teachers in each of the participating states. Teachers and other educators (e.g., principals and instructional coaches) were recruited by each state department of education. Two-day trainings were held in each of the four participating states in January, June, and July 2018.[3] Nearly 300 teachers participated in the four state-level trainings (Table 1). The Kansas and Alaska trainings had the greatest number of participants, with 129 and 109 attendees, respectively. A relatively small number of educators attended the Missouri and Wisconsin trainings, 29 and 16, respectively.

It is expected that in Project Year 4 (2018–19) that the Cohort 3 and returning Cohort 1 and 2 teachers will implement the instructional units and use the maps. Teachers may opt to complete feedback surveys, and ELM project staff will provide support via several modes (e.g., real-time, including telephone, e-mail and video; chats; webinars; website; newsletters). Additionally, teachers will participate in the research component of the project and provide evaluators with ELM unit usage data.

McREL International was hired as a third-party evaluator to gather data and report on the project's implementation and outcomes. This Year 3 evaluation report encompasses the period from October 2017 to September 2018 and focuses primarily on the project's implementation from the perspectives of the participants, partners, and project staff. Perceptions of impact on instructional practice are also provided.

The next section of this report includes a description of the data collection methods and analysis, followed by the findings. The report closes with conclusions and recommendations for ELM project staff to consider as they move forward with project implementation.

[3]A one-day training was also held with 29 elementary school educators in Fairbanks School District in Alaska.

Methods and Analysis

Data Collection Methods

Several data collection methods were used to inform the findings presented in this report. A survey was administered to participants in Cohorts 1, 2, and 3 who attended the state-level trainings. Cohort 1 and 2 participants were surveyed on how they had implemented the ELM units and maps and the impact on instructional practice in spring 2018. Cohort 1 and 2 participants continuing with the project participated in a focus group held at each of the state-level trainings. Telephone interviews took place with state partners and project staff in summer 2018.

2018 Training Survey

At the end of each state training, an evaluation survey was administered by a McREL evaluator. The survey was completed by 229 out of 281 participants, for a response rate of 82% (Table 1).

Table 1. Training Survey Response Rate

State	Number Attending Training	Number Completing Survey	Response Rate
Alaska	109	79	72.5%
Kansas	129	107	82.9%
Missouri	16	16	100%
Wisconsin	27	27	100%
Total	**281**	**229**	**81.5%**

More than eight out of 10 survey respondents (82%) indicated that they were new to the project in Summer 2018 (i.e., Cohort 3) (Table 2). More than half (52%) reported they were participating in the math content area for the ELM project and approximately one-third (31%) indicated that they were participating in the ELA content area. More than eight out of 10 survey respondents (82%) reported that they are teachers.

Table 2. Description of Training Survey Respondents

State	Cohort			Content Focus			Role Type		
	1	2	3	ELA	Math	Both	Teacher	Admin	Other
Alaska	2.5% (2)	12.7% (10)	82.3% (65)	36.7% (29)	50.6% (40)	5.1% (4)	73.3% (55)	8.0% (6)	18.7% (14)
Kansas	0.1% (1)	8.4% (9)	87.9% (94)	29.9% (32)	51.4% (55)	6.5% (7)	92.5% (99)	2.8% (3)	0.1% (1)
Missouri	6.3% (1)	18.8% (3)	68.8% (11)	37.5% (6)	43.8% (7)	12.5% (2)	87.5% (14)	6.3% (1)	--
Wisconsin	14.8% (4)	14.8% (4)	66.7% (18)	14.8% (4)	59.3% (16)	14.8% (4)	96.3% (26)	--	--
Total	3.4% (8)	11.4% (26)	82.1% (188)	31.0% (71)	51.5% (118)	7.4% (17)	82.1% (188)	4.4% (10)	6.6% (15)

Note. Some survey respondents did not indicate their cohort, content focus, or role type; therefore, percentages will not add up to 100 for those three categories.

The training evaluation survey consisted of three parts: an evaluation of the ELM training, an evaluation of the ELM system (i.e., software), and four open-ended items.[4] The training evaluation portion of the survey consisted of 35 items in seven categories (e.g., presenter quality; materials; practical and environmental issues; objectives; content; outcomes; and quality, relevance, and usefulness). The second part of the survey on the ELM system included 10 items. Both parts one and two included selected-response items that used a 5-point Likert scale, ranging from (1) *strongly disagree* to (5) *strongly agree*; a *not applicable* response option was also available for respondents who believed that the question did not apply to them. The survey is provided in Appendix A.

Cohorts 1 and 2 Implementation and Impact Survey

An e-mail to complete an online survey was sent on May 1 to the 24 Cohort 1 and 57 Cohort 2 participants. The survey is provided in Appendix B; open-ended responses are provided in Appendix C. The survey was available for a four-week period and three e-mail follow-ups were extended for non-respondents. Fifty-eight teachers responded for a response rate of 72%. The majority of respondents taught third grade (29%) while another one-fourth taught fifth grade (26%) (see Table 3). One-fifth of the teachers taught either second grade (19%), fourth grade (21%), or seventh grade (21%). Approximately two-thirds of the teachers (62%) were participating using the mathematics materials and the remaining teachers (38%) were using the English language arts (ELA) materials (see Table 4). The majority of survey respondents were from Kansas (40%) with an

[4] State-level summary of findings were developed following each training and findings from the four open-ended items are in those summaries.

additional one-fourth (26%) from Wisconsin and one-fifth from Alaska (20%). A few respondents were from Missouri (10%) and Iowa (3%) (see Table 5). It is worth noting that the percentage of respondents from each state was similar to the percentage of participants from each state.

Table 3. Grade Level Currently Teaching

Grade Level	Percentage
Grade 2	19.0%
Grade 3	29.3%
Grade 4	20.7%
Grade 5	25.9%
Grade 6	10.3%
Grade 7	20.7%
Grade 8	12.1%
Other: K–5, kindergarten, 9–12 and Pre-1, high school intensive math, instructional facilitator, instructional coach (*n* = 3)	15.6%

Note: Total number responding = 58. Percentages may not add up to 100 because respondents had the option to select all responses that applied.

Table 4. ELM Content Area Assigned

ELM Content Area	Percentage
English language arts (ELA)	37.9%
Mathematics	62.1%

Note: Total number responding = 58. Percentages may not add up to 100 due to rounding.

Table 5. State Represented

State	Percentage
Alaska	20.1%
Iowa	3.4%
Kansas	39.7%
Missouri	10.3%
Wisconsin	25.9%

Note: Total number responding = 58. Percentages may not add up to 100 due rounding.

The survey included forced choice items on ELM unit implementation, organization and administrator support, ELM project experiences, and use of maps and their impact on instructional practice. There were several open-ended questions targeting the use of ELM units in instruction, changes in student learning, changes in understanding of formative assessment, and changes in ability to provide personalized instruction.

Cohort 1 and 2 Focus Groups

McREL led focus groups at each of the state trainings with Cohort 1 and 2 participants who intended to continue ELM project participation. Five focus groups were held, along with one interview with an individual unable to participate in the focus group.[5] The number of participants in the focus groups ranged from five to nine. Eleven of the individuals were Cohort 1 participants and 27 were from Cohort 2. Fourteen of the individuals were ELA-focused and 24 were math-focused. The purpose of the interviews was to obtain feedback and insights from the teachers' participation in the project. As such, the discussion was guided by four lines of inquiry:

1. Implementation
2. Supports
3. Challenges
4. Impact

Partner Interviews

McREL held individual partner interviews in August with the primary contacts of three of the four participating states. A total of three interviews with four contacts were conducted by telephone; the average interview length was 22 minutes.[6] The purpose of the interviews was to obtain feedback and insights from the partners on their state's participation in the project. As such, the discussion was guided by five lines of inquiry:

1. Implementation and recruitment
2. Teacher supports
3. Communication and collaboration
4. Successes and challenges
5. Sustainability, scale-up and replication

Project Staff Interviews

Individual telephone interviews were conducted by a McREL evaluator with ELM project staff between July and September 2018. A total of 11 staff members were invited to participate in an interview; all 11 accepted. The average interview length was 37 minutes. Staff members represented project leadership/administration (n = 5), research/content staff (n = 4), and technology staff (n = 2). The purpose of the interviews was to obtain feedback and insights from project staff on the ELM project and its implementation to date. As such, the discussion was guided by seven lines of inquiry:

1. Project implementation
2. Recruitment (asked only of project leadership)

[5]Two focus groups were held in Kansas.
[6]One state had two contacts who participated in a joint interview.

3. Teacher implementation and supports
4. Communication and collaboration
5. Reflections and reactions to surveys and focus group findings
6. Successes and challenges
7. Sustainability, scale-up and replication

Data Analysis

The partner and project staff interview data were analyzed by question and by theme within each question. Themes were identified and summarized by salient and prevalent issues. Findings were reported as a theme if feedback appeared in two or more comments. Additional findings were also reported, but not as themes. For each theme, representative comments from each participant group are provided. Additional comments were also included to encompass the breadth of feedback provided. Interview protocols are provided in Appendix D.

Descriptive statistics (percentages, means, and standard deviations) were calculated for forced-choice items on the surveys. Responses to open-ended survey items were analyzed by question and by theme. Data were segmented into passages through coding. Themes were then identified and summarized by salient and prevalent issues.

Findings

The findings presented in this report are based on data gathered from interviews of the Cohort 1 and 2 participants, state partners and ELM project staff; the Cohort 1 and 2 implementation and impact surveys; the end-of-training evaluation survey completed by Cohort 3 and returning Cohort 1 and 2 participants; and project documentation. Findings are organized by the primary evaluation areas: (1) recruitment and implementation, (2) Cohort 1 and 2 impacts on instructional practice, (3) Cohort 3 and returning Cohort 1 and 2 state-level trainings, (4) successes and challenges, (5) communication and collaboration, and (6) sustainability, scale-up and replication.

Recruitment and Implementation

Information on recruitment efforts and implementation was gathered from the perspectives of ELM project staff and state partners. Findings are presented below and organized by stakeholder group.

Project Staff

Members of the ELM project team were asked about the extent to which the ELM project has been implemented as proposed and any adjustments that have been made. They were also asked about the extent to which teachers had implemented units as intended and to provide descriptions of the supports project staff provide(d) to teachers in their implementation of the units. Lastly, project leadership were asked to reflect on the successes and challenges of recruitment efforts, as well as any lessons learned about recruitment that would be useful for future projects. This section describes staff's responses in these three areas.

Implementation

ELM project staff who were familiar with the original project proposal were in agreement that **the ELM project "is going well" and has been "implemented very closely to how it was proposed."** They reported **that the project has gone above and beyond the original proposal in several areas.** Staff expressed the perception that there has been "a good faith effort to keep it close to what was proposed," as reflected in selected comments:

> *We started to veer away a little bit from the original intent of the project with some elements that we were adding to the software and stuff, and we really reined it back in and focused more on the original ideas of creating the units and providing the teachers with a basic software to use and the proposed test element as well.*

> *[On] the technical side, I think we have been doing pretty well, keeping on track and doing whatever we said we would … I think it is pretty much the same on the education side, that the maps and the resources and everything are being delivered as proposed.*

I would say that I feel like it is being implemented well. A lot of changes seems like were made in the last year, year and a half, but I think everything is on track. I think it is going pretty well. Just things that were originally I guess in the grant that had either been kind of somewhat put on the back burner or overlooked and everything. It seems like everything is out there now and being attended to.

Several staff shared that the project has **surpassed their expectations and exceeded the scope of the proposal** by going "a little above what we initially said we would do in the research project." These areas include "creating … a communication tool within the software so teachers could talk to each other" and creating a standards crosswalk. As one staff explained, "We have actually completed the crosswalk, and built a little program that will complete the crosswalk in the software. That, to me, is above what we said we would do." The Student Locater Tool was also mentioned by several staff members who said that it is "adding [to] and enhancing what we had proposed," in part because it "has a lot more features than it was proposed in the original documentation, which was just … providing a testing mechanism for teachers to use the map model, but it has way more functionality than that."

ELM project staff were asked the extent to which teachers are implementing the ELM units and learning maps as they were intended. **Staff members familiar with teachers' implementation expressed a wide range of opinions on teachers' implementation.** Several staff reported that "some teachers are rocking it" and that they are "hugely impressed by those educators…who decided to make the learning map software student-facing…without any support or prodding." One staff member commented that these are "super teachers" who are "going beyond…anything we could have imagined." This staff shared that some teachers in Alaska who "work in the more remote areas where they are also teaching cross-grade classes [were] talking about how they can use the work we have doing to help manage their…cross-grade classes." In addition, "in Kansas the teachers [were] talking about they use it…when they pull [students] out for…Multi-Tiered System of Supports [work]."

Most of the ELM project staff indicated that they **believe "teachers are implementing it fairly well according to the plan" and "implementing [the units]…in a variety of ways**." As one staff member shared, "The majority of our teachers are using the tool in a really positive, impactful manner. Just talking to them as the trainings and reading through the feedback, you can tell that they are implementing the units and they are using the maps pretty frequently." These include teachers who "have been on this project the longest" and who "have embraced the system more and embraced the instructional units." One staff member described the range of ways teachers implement the units: *Some are just using the learning maps to plan their instruction, but not really focusing on the units. Some are more focused on the units. Some are doing the units pretty much as prescribed. Some are adjusting the units for their students, which I think is great, and making adaptations as necessary. I think that some teachers are using pieces of the units. Some teachers are using the whole thing.*

A common theme among those staff members familiar with teachers' implementation was disappointment that **some teachers were not implementing all "six units over the course of the year" and that others were using it less often than anticipated**. These variations in implementation ranged from "some teachers [who] have implemented six units, some teachers have implemented at least two, [and] a percentage of new [teachers] that have implemented maybe one or none, especially in the first year." Staff members said that teachers new to the project face the challenge of finding time to implement the units and "make it so that it conforms to the curriculum that they are told to teach." One staff member shared that, after attending training, "some teachers say, 'I do not think I am ever going to be able to try this. This is just too much. I do not have time this year.'"

A second area in which staff members **expressed discouragement with teachers' implementation was the number of feedback surveys they completed**. While the project was "originally laid out [so] we had hoped to get at least six feedback surveys from every teacher" several staff members reported "that has not been the case." Two staff members expanded on this topic:

> *I know that we have many teachers who did not complete six [units] but did some and did…feedback surveys for some of them. I think the initial…quantity of participants, and number of units delivered, and feedback was less than anticipated.*

> *There are a lot of teachers that have not done any surveys… it is just kind of disappointing because [we were] looking forward to all this feedback, and organizing it, and evaluating it, and categorizing it, and seeing what we could do…I am pretty certain that we are getting a lot more feedback from math. I do not know that would imply about the content or the quality of the units being developed, or if that it is just more math teachers took after it, but I am pretty sure there is a lot more from math than the ELA overall.*

Teacher Supports

ELM project staff were asked to describe the ways in which they have supported teachers' implementation of ELM project activities in their classrooms. Project staff listed numerous methods by which they support teachers, including the summer trainings, the ELM Insights newsletter, web-based interactive supports (Zoom meetings/webinars/chats), information on the website and embedded within the software, emails, and site visits.

Many staff members indicated that **web-based support, primarily Zoom video meetings conducted "at least once a semester, sometimes two or three times a semester," were designed to provide teachers with the opportunity to receive information from the ELM team, collaborate with each other, and ask questions of the team about content and the software**. Although these chats "were not always well-attended" several staff members noted that they considered them successful. One staff member elaborated on the content area chats:

> *We did math chats, where we talked about popular buzz-type stuff in math [and]…a couple on number talks. We could talk about different things and then we also opened it up to 'is there*

anything in the math units or math content that you want to share with your colleagues?' Then we also did the same for ELA. ELA had some content chats where teachers could attend the video meetings and discuss what was happening in ELA and ask questions of their peers. In the case of math and the ELA content, we wanted to be more facilitators and not necessarily like they were attending a class or something, to really encourage that peer cooperation.

Several ELM project staff also reported **that the mapping software and resources were purposely created to support teachers' implementation of the units** and were meant to "provide teachers with…an organizing structure…for them to use in the classroom." These materials were described as being "very clear and straightforward" with information about "what research is supporting" the units. Staff members also shared that they are "always updating materials and putting out new materials…as those things become available." One staff member reported that "the structure of the instructional resources [has been modified] to support teacher feedback" which in turn has "absolutely influenced the map itself." This "communication loop" was identified as an essential part of the continuous improvement cycle and includes software with a "mechanism for [teachers]…to report problems or just have general discussions about how the software works." Professional development is also "embedded in the system" and provides teachers with information on "how to teach students concepts in certain areas…of the learning map." It also provides "teachers with the professional development necessary for them to figure out how to [use the software]."

Personal communication, most often through email and occasional site visits, was also described as a crucial support for teachers in their classrooms. Several staff members commented that they "send out personal communications" to connect with teachers, gather feedback, and offer help. They also indicated that they are "really responsive to emails that [come] in" and "somebody gets back to them right away." This two-way communication has been facilitated by the creation of a "uniform email account" (EnhancedLM@ku.edu). In addition, ELM project staff reported that they "really did emphasize that, 'Hey, if you need help, please reach out to us.' We are happy to set up individual Zoom meetings. We are happy to email with them or talk with them." Although infrequent, site visits to teachers' classrooms were also used to support teachers. One staff member noted that these site visits seemed "impactful" and described the process:

We went out into the classrooms after communicating with the teachers and just watched them implement the lesson and talked with them about what was going on. We offered site visits to any of our teachers that felt that maybe they wanted some more support or just wanted us to come in and see what was going on.

Recruitment

In addition to two leadership team members who were directly asked about recruiting, most project staff also provided feedback in this area. Overall, **many staff members saw recruiting as a "one of the biggest challenges" of the project.** This was attributed to several sources, including difficulty in spreading the word among teachers about the project and coordinating with state partners. Attrition of Cohort 1 and 2 teachers was also mentioned as a problem that continues to

detrimentally affect participant numbers, perhaps in part because "there was not as much incentive to participate in the third year as there was in the first two years."

Staff noted that, because the project "started out so small, with only five teachers per subject per state…trying to get the word spread so that we could get…more people recruited the following year [for Cohort 2] was really hard." This was compounded in the following years, in which "we have had more trouble with recruiting teachers and meeting the numbers of how many teachers we were supposed to have participating each year." In fact, one staff member reported that the "recruiting went a little lower in the third year." Another staff member explained:

> *The first year was a little bit [challenging]...I think we were probably closest [to our goal] that year. We had a little bit of a struggle on the math side. We were lower in numbers in math. The second year we were able to retain a lot of our math…teachers. That was nice because then we kind of had that jump in numbers…and in math we were close to the [desired] number of teachers recruitment-wise. But we were still somewhat low the second year...But then this…third year was a big struggle.*

One project team member also acknowledged that teachers' "knowledge of the program itself" may have impacted the team's ability to recruit and retain participants. This staff member stated, "We have definitely had a couple situations where teachers really were not quite sure what they were getting into, and [thought] there was a much stronger focus on pre-/post-tests and this kind of easy-to-implement program, almost like…a curriculum, which is not what [it is]."

A second theme related to recruiting focused on the **state partners' involvement in the project and their part in recruiting teachers**. Because the recruiting process "is not fully in our control" many staff felt like they "depend on the state for recruitment and the recruitment plans they put in place" and that "each of the states did something different." This resulted in "some opportunities for better outcomes in some of the states" where recruiting efforts did not meet anticipated targets. ELM project staff "collaborated with the…state partners…and provided them with materials, like flyers and pamphlets and…created a recruitment video to try and help recruit teachers." One staff member shared that, in Missouri, "they have got a lot going on with their standards change. That is resulting in a state test change and having to create new items and assessments and...they are really relying heavily on their teachers for that" which may have affected the state partner's ability to recruit teachers for the project.

Staff were also eager to point out **areas of success in recruiting, specifically that they reached the desired number of participants in Alaska and "that the state partners in [some states]…were a lot more involved in general.** Any time there was a state partner call, they were consistently there. [One state partner] had been really involved and passionate about the project since the beginning, so I think that helps a lot. I know that in [another state]…they were reaching out to principals and having principals recommend teachers…it was a lot of work and hands-on outreach done by…the state partner." Several staff members expressed appreciation for the state partners' hard work and passion for the project, including "solid, consistent people that put in that effort and reached out in a much more aggressive manner" such as "work[ing] with individual

school districts and building administrators to ask for and solicit nominated teachers. Because that actually…signaled to the teachers that they had support from their administration."

As result of the challenges and successes of the recruiting, **several staff offered "lessons learned" about communicating clearly with state partners and participants.** They indicated that is vital to communicate "the intent of the project from the viewpoint of the teachers and what their responsibilities and required participation would be" as well as to "not minimize the necessary involvement of the partner in order to get [participants]." One staff member shared, "I think it is important to portray [the project] to [state partners] as something that they do need to be willing to invest in and if they are not willing because they are too busy or have too many competing initiatives in their state, they need to make a fully informed decision." Included in these lessons learned were staff members' insights into maintaining frequent contact with state partners and playing "a much more active role in reaching out to them more frequently" as well as "maintaining…momentum" with teachers to ensure their participation in the summer trainings after they were initially recruited.

State Partners

State partners were asked about the extent to which the ELM project was rolled out in their state in the way they had anticipated. They were also invited to reflect on the successes and challenges of recruitment efforts over the life of the project, as well as any lessons learned about recruitment that would be useful for future projects. Lastly, they were also asked to indicate any additional supports they believe would help teachers be successful in their implementation of the units. State partners' responses in these three areas are described in this section.

Implementation

State partners shared their perceptions about the extent to which the ELM project was rolled out in their state in the way they had anticipated or planned. The state partners indicated that **they were not "sure what to expect" but in general the roll-out "went just fine" and met their expectations**. Additional feedback from two of the states is as follows:

- State 1: This state partner shared that, when the state signed on to the ELM project, they were told "'You are going to be able to participate as much or as little as you can.' We have been kind of participating on the lesser end of that." This partner then shared that "the Enhanced Learning Map team at KU provided excellent support" and that the project "has rolled out the way we had anticipated."

- State 2: This state partner indicated that, because of changes in the staffing at his/her department, he/she was brought in after the project started and was therefore uncertain of how the project was meant to be implemented. In addition, the partner commented that s/he "did not know where to go to get any information" on project implementation.

Recruitment

State partners were asked about their recruitment efforts and the successes and challenges they encountered. In addition, they were provided with the opportunity to share any lessons learned that could be useful for future, similar projects.

State partners **described recruitment as a challenge**, specifically in "trying to figure out a way to get to the audience that we needed" and especially during the first year where "we did not get as many [teachers] as we had hoped." Two state partners reflected on different methods of recruiting teachers that were successful in their states and which could be used in the future. The first strategy was to mail letters to superintendents and principals, and the second was having teachers from Cohort 1 spread the word to their peers, as described below:

> *What made it successful…ended up…being postage stamps because email just was not getting it. We started mailing out letters to all the superintendents and principals…that we had not contacted before…and that really yielded great benefits. Just that physical letter…they had that physical piece of paper that they could refer back to, and I mean they just poured in. I felt like I was entering entries nonstop for a week… I would not have thought that a mailing would do it and you know we are always hesitant to mail anything out anymore because we are trying to save money…[but] I think it was a good tool.*

> *It was similar to "Telephone a friend." [Cohort 1 teachers]…were saying, "This is really cool." Then we got more people from one district to participate, so they had a group. And then we contacted another district, they sent a team so that they had a cohort within their district. And then it kind of just went exponentially from that. Where we intentionally planted that seed, it grew the way we had hoped…When we had a teacher buy in and we could have a teacher do the talking, that was what was the most effective for us.*

On the other hand, a third state partner commented that, despite "several communications that went out to districts" and information transmitted to school personnel through an online newsletter, "it did not seem like we quite got the numbers we wanted." This state partner went on to note that "calls…with KU were really, really helpful" in that "they were very good about offering us the language and the attachments to send" to teachers. However, s/he expressed concern that information and material from ELM project staff was not always delivered "in a timely manner" in that "sometimes they were not there at the right time to send out to our contacts." This became especially important to consider their timelines and addressing questions such as, "When do people go back to school? What is typical in each state as far as when teachers need be involved in something?" This state partner went on to explain, "Our large district…just recently changed their policy, so if any teacher wants to take professional leave, it [requires] a 45-day notice."

Supports

State partners were also invited to reflect on additional supports for teachers that they believe would help teachers implement the ELM units. State partners indicated that **the ELM team**

provided all the necessary supports. Interestingly, two state partners took this opportunity to reflect on ways the state departments of education could better support teachers, by "provid[ing] more cohort support that would have helped them in their practice" and by working to close the "disconnect between the department…and the actual teachers." One state partner noted that s/he does not "really have a good way to talk to the teachers that were in the project" and as a result could "only make one anecdotal observation, and that is that sometimes there is a gap between programs and teachers and administrators." This state partner went on to explain that "closing that gap and making sure the administrators really do understand what this program is" would be key for its continued success "because they more than likely would be able to free up some time or help remove obstacles, so that the teachers can work with us, or work with the bigger content community to get the word out on what this project is."

Cohorts 1 and 2 Survey

In the survey administered to Cohort 1 and 2 teachers they were asked about the implementation of the ELM units, including the number of units implemented, specific materials that were used, and challenges encountered. Teachers were also asked about supports received during the implementation phase, including supports that they received from their principal, state or district level contacts, and ELM project staff. The survey included a series of questions about ELM resources and supports, experiences with the ELM software, and sharing of the maps and resources with colleagues. Described below are findings related to those areas.

ELM Units Implementation

Cohort 1 and 2 teachers were asked about the implementation of the ELM units, including the number of units implemented, specific materials used, and challenges encountered. The findings related to those areas are described below.

Overall, ELA and mathematics teachers varied in the number of ELM units they fully implemented in the 2017–18 school year. Approximately half of the teachers responding to the survey implemented two or three of the units (45%) (see Table 6). Of the 22 ELA teachers, approximately one-fourth (23%) taught three or six units (23%). Most mathematics teachers reported teaching two or three units, 24% and 27%, respectively.

Table 6. Number of ELM Units Fully Implemented

Overall (*n* = 56)		ELA (*n* = 22)		Mathematics (*n* = 34)	
Number of Units	Percentage	Number of Units	Percentage	Number of Units	Percentage
None	14.3%	None	18.2%	None	11.8%
1	8.9%	1	9.1%	1	8.8%
2	19.6%	2	13.6%	2	23.5%
3	25.0%	3	22.7%	3	26.5%
4	8.9%	4	9.1%	4	8.8%

Overall (*n* = 56)		ELA (*n* = 22)		Mathematics (*n* = 34)	
Number of Units	Percentage	Number of Units	Percentage	Number of Units	Percentage
5	3.6%	5	0.0%	5	5.9%
6	14.3%	6	22.7%	6	8.8%
More than 6	5.4%	More than 6	4.5%	More than 6	5.9%

Note: Percentages may not add up to 100% due to rounding.

Teachers were asked via two open-ended survey items to explain the reasons that they were unable to implement any or more of the units, respectively. Seven teachers (three ELA and four math; see Table C1 in the Appendix) said they did not implement any units due to time constraints and alignment to the district-adopted curriculum. Three ELA teachers said they did not have adequate time. One said, "I was unable to implement units this year due to time restraints and I did not get enough time to look them over and prepare for teaching the units."

Three math teachers reported that non-alignment with district curricula made it difficult for them to fully implement the ELM units. One math teacher responded, "I implemented parts of units. However, with the new math curriculum within my district this year, I was unable to manage that learning curve with full ELM implementation."

Teachers who reported implementing one unit but fewer than six units were asked why they were unable to implement more units. Thirty-six teachers (12 ELA and 24 math) responded to this question. Their responses echoed the challenges teachers reported about fully implementing any units: time, curriculum alignment and content availability (see Table C2 in Appendix). One math teacher said,

> *The amount of time committed to teaching the district curriculum was the main reason I was not able to complete the units provided by ELM. The second reason was the fact that my students' skill level is about a year below grade level. I had to spend some time re-teaching skills that were missed from previous grades. Since I am required to teach out of a standard curriculum, I had to cover missed skills, which provided a double-edged sword in the time. I have below grade level students, and all materials either from ELM or the district are at grade level.*

The adherence to district pacing guides, coverage of students' missing knowledge, skills and understanding, and the adoption of a new curriculum during the 2017–18 school year all impeded ELM implementation. An ELA teacher shared, "It was difficult to match the content of the lessons with my current curriculum."

Several teachers said content availability presented implementation challenges. Teachers said that the units did not meet the criteria for content they were teaching or units were not available for the topics and skills students needed. In one case, an ELA teacher stated:

> *At the beginning of the year there were not many fifth grade ELA units that I could use. I was able to use either pieces or full units that would total seven. I had to use about two units that were a grade lower than fifth.*

Furthermore, a math teacher reflected on content availability at different points in the school year,

> *There were only three or four units for second grade and some of them were only posted near the end of the school year so I ran out of time to implement any more. I also implemented a few of the language arts units for second grade.*

ELM Materials

ELM project staff provided multiple materials for participants to use as part of each unit. Respondents were asked to describe the extent to which they used the materials and implementation challenges they may have encountered. The materials most frequently used by respondents were as follows: Student Activity (100%), Instructional Activity Handout (98%), Instructional Activity (96%), Instructional Activity Supplement (89%), Student Activity in Solution Guide (87%), Teacher Notes (85%) and the Enhanced Learning Map Document (68%).

Respondents reported less use of the Teacher Notes Video (23%), and the Student Locater Tool (15%). Figure 1 illustrates the extent to which respondents reported using the ELM materials. Interestingly, only one-fourth of the respondents (27%) said they completed a feedback survey for every unit they taught.

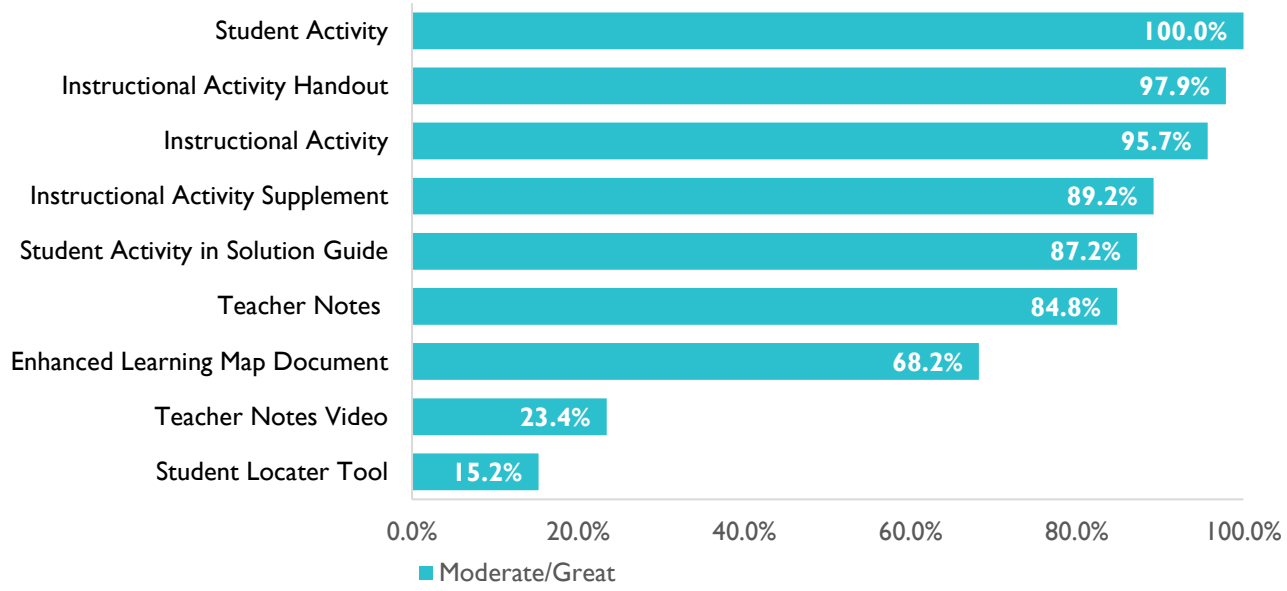

Figure 1. Use of ELM Materials in Instruction (*n* = 46)

A total of 26 teachers (nine ELA and 17 math) reported challenges in response to the open-ended question*: If you experienced any challenges implementing the ELM materials, what were they?* (see Table C3 in the Appendix). Challenges teachers reported included time, technical issues, content availability, and that the materials required modification. The technical issues that respondents identified included difficult navigation, slow loading times, and printing the materials. For example, the maps would not print correctly for some respondents. Others stated that printing improved when they reprinted the materials. Other responses included units that arrived too late in the school

year (after the teacher already taught a specific topic) and could not be implemented. One math respondent articulated the need to modify ELM units:

> *Some I had to modify. For example, I had to use Smarties instead of beans because I did not have any and I am unable to just run to the store since the closest store is an hour plane right away from where I am. I will be in a different school next year on the road system so hopefully that will be different.*

Overall, however, the most frequent response was time constraints. Although the time-related comments remain outside the purview of the curriculum developers, one teacher stated that it took too much time to prepare for implementing the units.

Supports

Nearly all respondents (89%) reported that their principals support involvement in the ELM project and nearly half of the respondents (48%) agreed that their principals provide opportunities for sharing the ELM materials (see Figure 2). Slightly over three-quarters (77%) of respondents agreed/strongly agreed that the ELM project staff provided the information and guidance they needed, while less than half (46%) agreed that the state or district contacts provided support.

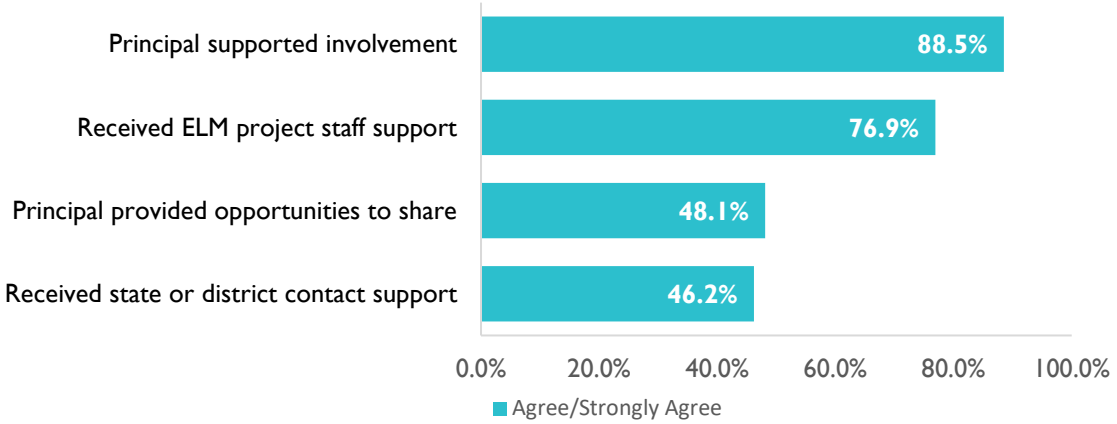

Figure 2. Administrator and Organizational Support (*n* = 52)

Teachers were asked: *What additional information/guidance would you have liked to support your implementation of the ELM units?* (see Table C4 in the Appendix). Twenty-six teachers (eight ELA and 18 math) responded to this item. Teachers requested specific assistance related to additional materials (e.g., "more lessons with the actual text or texts that you could use with the lessons"), entering information, submitting feedback, and integrating ELM units with district-adopted curricula. One math teacher requested that the ELM staff train principals:

> *My principal does not know about the ELM project. He does not support nor does not care about the program. It would be nice if ELM would provide a two-day training for all principals so that they may get an understanding of the program.*

Respondents also indicated that although they did not request specific help, they were confident that it was available. As a math teacher said, "I felt I could call or email at any time to ask a question, etc. The ELM project people were always available and quick to respond."

Overall, the teachers requested support related to materials and additional professional learning related to ELM. One math teacher, however, described the effects of collegial support on implementation, "I really liked the second training where I got to talk to colleagues who were doing the same thing as me and hear what they were doing with it; that helped me the most." Teachers were asked to indicate how satisfied they were with the ELM project staff's effort efforts to engage them in the project. Nearly all (90%) of respondents indicate they are satisfied or strongly satisfied with the ELM project staff's effort (see Figure 3). However, only two-thirds (65%) of respondents are satisfied or strongly satisfied with their state education department efforts to engage them.

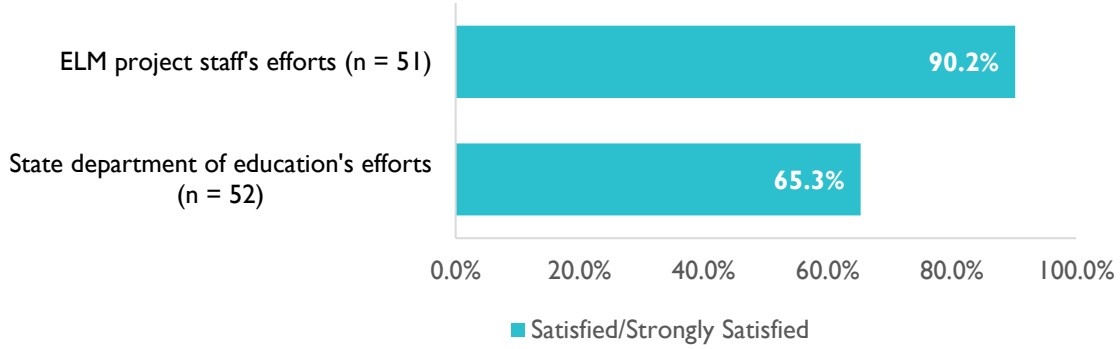

Figure 3. Satisfaction with Engagement in Project

Teachers had the option to describe their satisfaction with ELM staff in engaging them in the project. Twenty-one teachers (five ELA and 16 math) responded to this question (see Table C5 in the Appendix). Teachers described the ELM project staff as helping when needed, responsive to questions, engaging, and "went out of their way to be of assistance and support!" (ELA teacher response). A math teacher described how ELM project staff provided support for participants:

> *They have always been very friendly, knowledgeable, helpful, and willing to make accommodations to fit the needs of what needs to be done to engage us in the project. They make it easy to ask questions and train what we specifically want and need.*

Teachers reported that ELM project staff "sent several emails" that updated them on information related to additional webinars, chats, and site updates. Overall, the responses demonstrate that teachers felt supported by the ELM project staff. The frequent communications through emails showed teachers that continued learning opportunities would be available for them.

A total of 20 teachers (four ELA and 16 math) responded to the open-ended item, *Would you like to comment on your response to satisfaction with your state department of education engaging you in the project?* (see Table C6 in the Appendix). Thirteen teachers (one ELA and 12 math) said they did not have contact with their state department of education. One math teacher expressed frustration about the state:

I went to a state math meeting in the fall to present to fellow math teachers. I felt that we did a good job, but never heard anything further from the state people. They do not acknowledge what we are doing in either a positive or negative way. When we started last year at the meetings in Kansas City, [state] did not even have a representative there! At the fall meeting, the state math leader said the state was happy to be working with the project, but they have done nothing in my opinion to support that statement.

Other respondents (one ELA and three math) indicated that they want more involvement from the state. For example, an ELA teacher said that while s/he was appreciative that the state staff member was at an earlier meeting to assist with ELM, further state involvement would have been helpful, "I wish she had come to the training last summer in Kansas City so that we felt like she was eager to take part in the project." Although most responses indicated little contact with the state or that respondents wanted more state involvement, three teachers (one ELA and two math) said the state was supportive and helpful.

ELM Resources and Supports

The respondents identified the most useful ELM resources as the ELM units (96%), summer training (96%), ELM project staff support (83%), learning maps (79%), and website (78%) (see Figure 4). A smaller percentage of teachers experienced the archived support webinars, support chats and newsletters as useful (63%, 63%, and 50%, respectively).

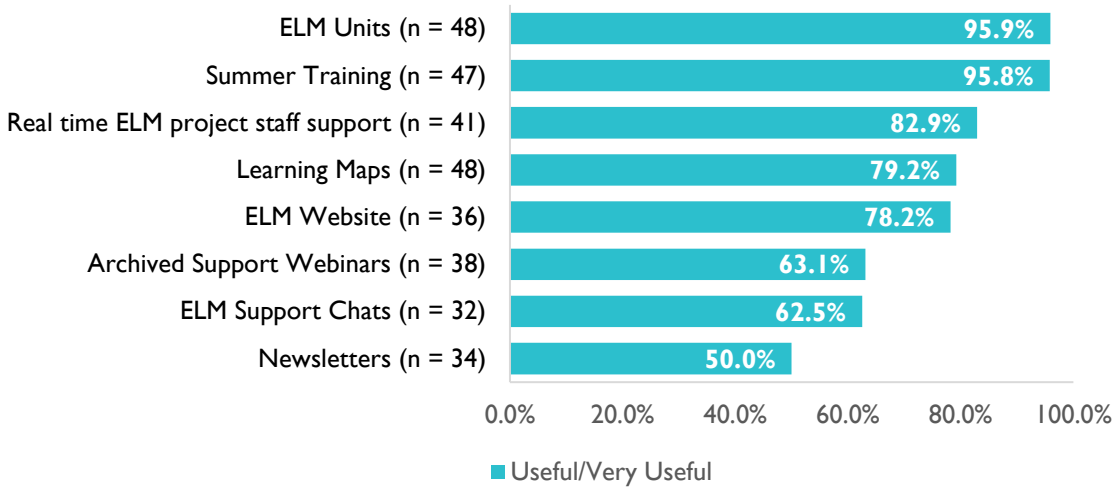

Figure 4. Usefulness of Resources and Supports

ELM Software

Overall, respondents reported satisfaction with the ELM software (see Table 7). One of the most compelling findings is that nearly all (89%) agreed they would continue to use the software ***after*** their participation in the project ends. This finding suggests that respondents perceive the software as valuable for their instructional practices. Furthermore, nearly three-quarters of

respondents (70%) said the functions are well-integrated and over half agreed it is easy to use (61%). Finally, over half (57%) expressed confidence in using the software.

Respondents were also asked questions about the challenges they faced in using the software. Nearly two-thirds (61%) disagreed with the statement that there is too much inconsistency in the software. Over half (59%) disagreed that they needed technical support to use the software and that the software was unnecessarily complex (58%).

Table 7. Experiences with ELM Software

What were your experiences with the ELM software?	Responses					Descriptive Statistics	
	Strongly Disagree	*Disagree*	*Neutral*	*Agree*	*Strongly Agree*	*M*	*SD*
I thought the ELM software was easy to use. (*n* = 49)	2.0%	10.2%	26.5%	46.9%	14.3%	3.61	0.93
I needed the support of a technical person to be able to use the ELM software. (*n* = 44)	20.5%	38.6%	20.5%	15.9%	4.5%	2.45	1.13
I found the various functions in the ELM software to be well integrated. (*n* = 47)	2.1%	6.4%	21.3%	55.3%	14.9%	3.74	0.87
I learned to use the ELM software very quickly. (*n* = 49)	4.1%	12.2%	28.6%	38.8%	16.3%	3.51	1.04
I found the ELM software very cumbersome to use. (*n* = 48)	8.3%	41.7%	22.9%	22.9%	4.2%	2.73	1.05
I thought there was too much inconsistency in the ELM software. (*n* = 48)	16.7%	43.8%	29.2%	8.3%	2.1%	2.35	0.93
I felt very confident using the ELM software. (*n* = 49)	2.0%	16.3%	24.5%	38.8%	18.4%	3.55	1.04
I needed to learn a lot of things before I could get going with the ELM software. (*n* = 48)	10.4%	29.2%	22.9%	31.3%	6.3%	2.94	1.14
I found the ELM software unnecessarily complex. (*n* = 48)	16.7%	41.7%	25.0%	10.4%	6.3%	2.48	1.09
I will continue to use the ELM software following my participation in the project. (*n* = 47)	4.3%	2.1%	4.3%	53.2%	36.2%	4.15	0.93

Sharing of Maps and Units

The majority of respondents (71%) said they have shared ELM units or learning maps with their colleagues. Most reported sharing materials one-on-one with colleagues (85%) or at their grade-level team meetings (63%) (see Table 8).

Respondents who had not yet shared the maps were asked how likely they were to do so with colleagues. Of the eight respondents to this item, three fourths reported they are somewhat likely (75%) or likely (13%) to share the materials with their colleagues. The other respondent (13%) reported that they were unlikely to share the materials.

Table 8. Sharing ELM Units and/or Learning Maps

In what type of setting have you shared the ELM units and/or learning maps?	Percentage
One on One with Colleague (*n* = 35)	85.4%
Grade Level Team Meeting (*n* = 26)	63.4%
Curriculum Meeting (*n* = 13)	31.7%
Community of Practice (*n* = 9)	22.0%
Other: Previous administrator, professional development in district in small group setting, district in-service (2) school board meeting (*n* = 5)	12.2%

Note: Percentages may not add up to 100 because respondents had the option to select all responses that applied.

Cohort 1 and 2 Focus Groups

As a part of the Cohort 1 and 2 focus groups, questions were asked about implementation, supports and challenges. Key findings that emerged from each of these three areas of questioning are presented below.

Implementation

Participants were asked whether the project expectations were reasonable. Expectations including attendance at the summer training, implementation of six units and providing feedback via surveys, and participating in evaluation surveys. Focus group attendees were also asked if the ELM materials and resources were easy to use and teacher-friendly. Findings were categorized into these two areas.

Expectations

Generally, the focus group participants in all four states had positive responses to what was expected of them (i.e., attending the summer training, implementing up to six units, providing feedback on the units taught, and completing evaluation surveys). They shared that the expectations were both clear and reasonable. One participant summed it up as, "I do not think they expect too much and there is no penalty if you do not do stuff…it is not like they come after you." A challenge mentioned in a couple of the focus groups was difficulty implementing all six units. Participants explained that the process of implementing the units was "really time-consuming" and sometimes there were not enough units available in their grade level to make it possible to implement all six at the appropriate time.

Materials and Resources

The focus group participants spoke highly of the ELM materials and resources that were a part of each unit. Although they remarked that the Teacher Notes were lengthy, they saw the value of the research. The instructional activities were one of the "favorite" aspects of the units and according to the participants kept the students "engaged." Teachers also valued the Solutions Guide and used it to address student misconceptions. One teacher commented that it was "really good to

read and to think about, because you wanted to make sure if you heard (a misunderstanding) that you cleared that up." Similar to the survey findings, focus group participants were less likely to mention use of the Teacher Notes Videos and the Student Locater Tool.

Supports

Focus group participants were asked several questions about available supports to prepare and assist them in implementing the ELM units. First, they were asked about the extent to which the summer training prepared them for implementation. Second, participants were asked about the support provided through ELM staff. Third, they were asked about other supports that facilitated the implementation of the ELM units. Findings were categorized into these three areas.

Summer Training

Overall, the focus group participants agreed that the summer trainings they attended were "very helpful" although some reported being "very overwhelmed" when they left the training. The participants liked the opportunity to collaborate with teachers from other states. One participant shared that it was "nice to see we all have similar standards, but we might implement them in different ways and present it in different ways, too." Participants also appreciated hearing the speakers who were a part of the 2016 and 2017 trainings and having an emphasis on formative assessment in addition to learning about the maps.

ELM Project Staff Support

In terms of the support offered by the ELM project staff following the training, focus group participants used terms such as "absolutely amazing," "wonderful," "very quick," and "prompt" to describe staff members' responses to e-mails and telephone calls. Anytime participants had specific questions related to the use of the units or maps, staff were quick to respond. One participant commented, "I am always amazed at how fast things happen and things change…I really like the timeliness of their responsiveness to my needs."

In two focus groups, participants reported a lower level of satisfaction with communications about the summer training sessions, including the cancellation of one of the Kansas trainings. Some participants opted to attend the Missouri training after they found out the training scheduled for Wichita was cancelled. However, the participants said they were not informed of the cancellation in a timely manner.

Although ELM project staff offered other supports, such as online chats and webinars, focus group participants reported that they did not use them. Participants who signed up for the online chats commented they were not well-attended. One participant commented, "I would go online for the ELA chats and I was the only one."

Other Supports

Focus group participants were asked about the other types of supports facilitated their participation in the ELM project. They were asked to consider both state education agency and school building-level supports. Participants reported that, while principals approved of their participation in the program, their interest did not extent beyond that. Participants explained that because the principal was not well-informed about the project itself, they were unable to provide meaningful support. One participant commented, "They signed off and said, 'Good luck' but she [the principal] has completely forgotten we are even doing it."

Focus group participants in two states reported having little contact with and support from their state department of education. In a third state, focus group participants were quite pleased with the support and involvement of their state department of education. For the fourth state, focus group participants did not comment on the state department of education's support.

Challenges

Focus group participants were asked about challenges they may have experienced when they implemented the ELM units in their classrooms. Time is a prevailing challenge, as is the case with many new initiatives. Focus group participants said that the time to become familiar with the mapping software and the units, and then determining where to implement the units into the existing curriculum, were challenges.

Focus group participants were enthusiastic about the maps and units and shared concerns about what would happen after the grant ended. Participants also shared the difficulties they had when trying to share the maps to their colleagues without "scaring" them, adding that the software "is hard to explain," which is a concern related to sustainability and potential scale-up.

Cohorts 1 and 2 Impact on Instructional Practice

In both the spring 2018 survey and focus groups, Cohort 1 and 2 teachers were asked how participating in the ELM project had impacted their instructional practice. Findings from each of the two data sources are presented below.

Cohorts 1 and 2 Survey

Teachers were asked to discuss their uses of the learning maps and the subsequent impact on their instructional practice. More than two-thirds of respondents (69%) reported that they accessed the learning maps to plan for and teach the ELM units (see Table 9). One-third of the respondents (33%) said they used the learning maps to plan for and teach state standards beyond those addressed in the ELM units.

Table 9. Purposes for Accessing the Learning Maps

For what purposes did you access the learning maps?	Percentage
Planning for and teaching the ELM units (*n* = 40)	69.0%
Planning for and teaching state standards beyond those addressed in the ELM units (*n* = 19)	32.8%
Did not access beyond the ELM training (*n* = 6)	10.3%
Other (*n* = 7)	12.1%
Other: MTSS [Multi-tiered System of Support] group, supplementing current topics in Carnegie learning, plan for instruction on an individual basis, differentiated instruction, extra support for instruction, student visual, communication with parents about curriculum	

Note: Percentages may not add up to 100 because respondents had the option to select all responses that applied.

Forty-one teachers (14 ELA and 27 math) responded to the open-ended question: *How have you used the Enhanced Learning Maps in your instruction this year? Please provide two or three specific examples.* (see Table C7 in Appendix). The most frequent responses related to introducing new concepts or specific concepts they taught; lesson planning; MTSS, intervention, or working with struggling students; identifying or measuring student learning targets; and identifying or remediating student learning gaps.

Both ELA and math teachers provided specific examples of using ELM to support instruction in specific topic areas, such as writing opinions about informational texts, teaching folktales to students, fractions, and subtraction. One math teacher provided a detailed overview of learning map use:

> *I have been using the ELM software during my lesson planning using district materials. I insert the intended skills of the curriculum in the ELM software. When nodes begin popping up, I develop diagnostic assessment questions based on the nodes. When I begin to notice patterns of mistakes with the different nodes, I work with students in groups to provide classroom instruction on specific nodes.*
>
> *Secondly, when I am teaching a unit, and I know how to teach a unit, I teach skills based on my knowledge and understanding. When I begin to notice students failing to understand skills, I go to the ELM software and pick out the nodes where my class is failing to understand. I take those specific nodes, and I develop classroom activities. Once I know when students have gained an understanding, I develop simple diagnostic assessments, and I move on to my unit of study.*
>
> *Thirdly, I have been the ELM software when teaching an ELM unit. I pick out a unit, and use the nodes as a guide to develop diagnostic assessment questions. Using these questions, I develop different units and classroom activities to re-teach missed skills. Then I commence to teach the ELM units.*
>
> *Finally, I have been using the ELM software as a diagnostic tool. I have been developing test questions of different kinds before I teach a unit. These allow me to start where my students are not*

successful. Once I know where to begin, I usually generate different nodes for students, groups, and the class. In the end, students begin to learn all my intended goals during a unit of study.

Furthermore, an ELA teacher shared how ELM units relate to standards when teaching specific topics/concepts:

I used [ELM units] in a couple of writing units when I needed a new example of how to teach a standard such as informative writing. I also used pieces of author's point of view and character traits. These I used the activities if not the entire lesson. I was looking for units to enhance my grade levels ELA instruction which I am responsible for writing all ELA curriculum.

ELA teachers also reported using the maps for guided reading groups. One ELA teacher said that the maps are used across multiple grade levels in both small- and whole-group lessons. The whole-group lessons were used for second-, third-, and fifth-grade students identified as English Language Learners. One ELA respondent shared, "I used R14.2 'Writing a Summary' with my fifth-grade group. It was a great way to reinforce summarization and to remind them how to create a thorough summary in writing."

Participants reported that the ELM units were helpful for lesson planning and identifying learning targets to include in the lessons. One math teacher said, "I used the map to help me lesson plan to see where students should be and where they are going next."

Figure 5 displays ways in which teachers have used the learning maps to enhance their instructional practices. Most teachers agreed that they used the maps to adjust instructional practice to identify students' misconceptions (76%), help students reach learning targets (72%), address gaps in students' understanding (70%), identify where students are in their learning and what they should learn next (67%), and adjust instructional practice to keep students moving towards their learning goals (67%). The least common practice was using the maps to communicate students' progress with parents (28%).

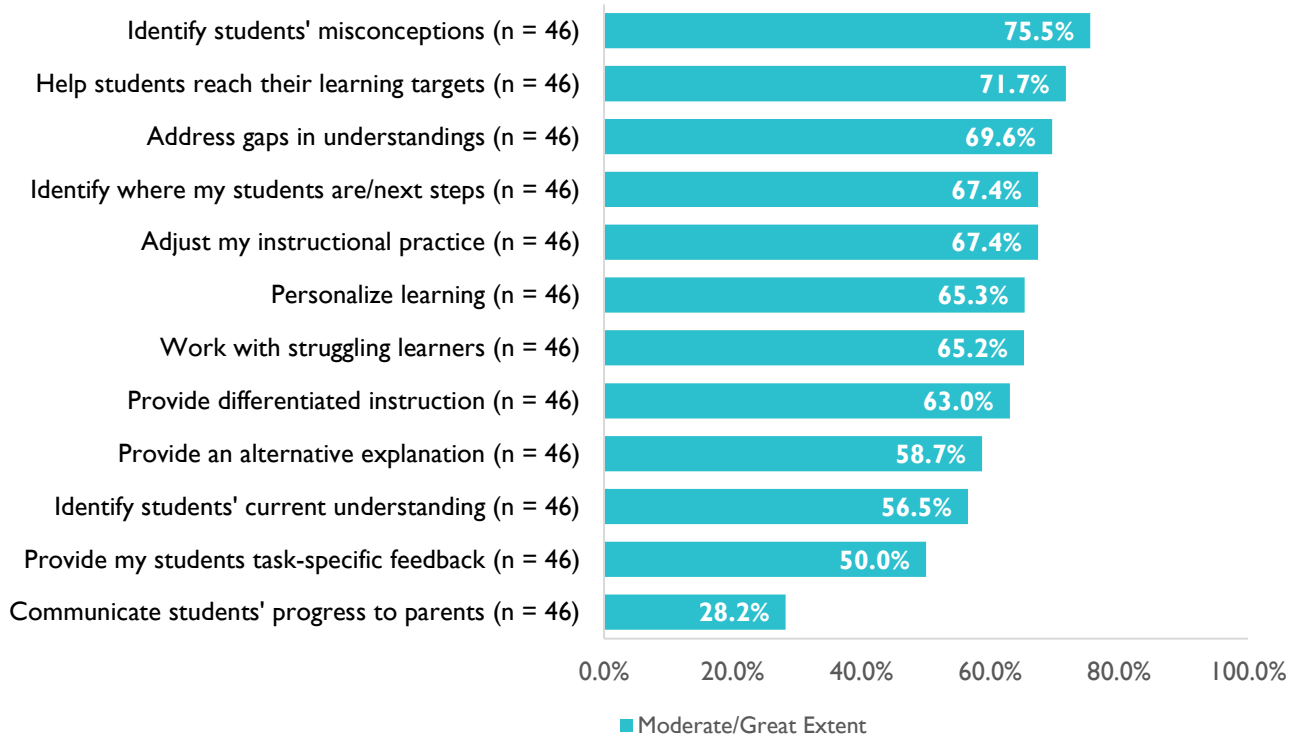

Figure 5. Use of Learning Maps for Enhancing Instructional Practice

Impact of Learning Maps on Instructional Practice

Survey respondents were asked to reflect on their instructional practices prior to their experiences with ELM and now by responding to the prompt: *I used to… But now I….* Thirty-seven teachers responded (11 ELA and 26 math). The most common response reflected a shift from teacher-directed to student-directed learning (see Table C8 in the Appendix). For example, teachers said that prior to using learning maps, they did more talking and demonstrating (e.g., solving math problems). Now, teachers report that they ask more questions, listen more closely to what students are saying, question students' reasoning, and let students guide their own learning. An ELA teacher shared this new experience:

> *I do a lot more questioning and reflecting, I used to reteach and go over the same materials slower; now I plug in the map and see where the students are missing the information and have gaps and I target that area and the level of success is far greater. I have found that going back through the missing parts of their learning has made the gaps in understanding disappear. Students are more relaxed as they are able to have a deeper understanding. I used to get blank looks and now I get engaged learners!*

A math teacher added:

> *I used to do a lot of showing how to do a math problem, but now I let them figure it out and show me how they did it. I used to do more 'teaching,' but now my students do more sharing of ideas and teaching each other. I used to tell students what they were going to learn, but now I teach to a specific target and use the map to help students see the target.*

Respondents reported that they used to teach and move on to the next lesson without concern for the outcome. Now teachers report that they think about how lessons are connected to one another and offer students a clear pathway for learning and assessment. An ELA teacher said, "I used to just teach lessons without regard to the outcome. Now I can give my students a clear understanding of what they are going to learn and how I am going to assess their learning." A math teacher added, "I used to think I knew where the students were on the map in my head, but now I have a map and can show them where they are in their learning."

Respondents also noted that while in the past they relied on a single source or strategy, such as implementing the district curriculum to teach a specific, isolated skill, they have now branched out into using multiple tools and strategies. One math teacher said:

> *I used to use a district provided curriculum, and taught students how I have been taught in school. For instance, I would use the district provided curriculum on learning about column addition. I would delve right into the algorithm of column addition to teach students the skill. I now use the ELM software and teach other functions and skills related to the intended skill. I then use different concrete functions to teach a skill based on the understanding of the students. I continually make changes to how I teach during the class. My lesson is never the same from the start to the end, and I add or subtract different concepts to my learning goals. Furthermore, students are the ones doing, learning, and making while I do a lot of questioning, guiding, and changing the content minute by minute, second by second.*

Survey respondents also indicated the extent to which the use of the learning maps impacted their instructional practices, as shown in Figure 6. Nearly two-thirds (62%) of respondents said that the extent to which they have more data available to provide personalized instruction for students is moderate to great. Furthermore, a majority (60%) report that their use of questioning strategies to gather evidence of student thinking has changed, and 60% say that their ability to make decisions about individual students needs has changed by a moderate to great extent.

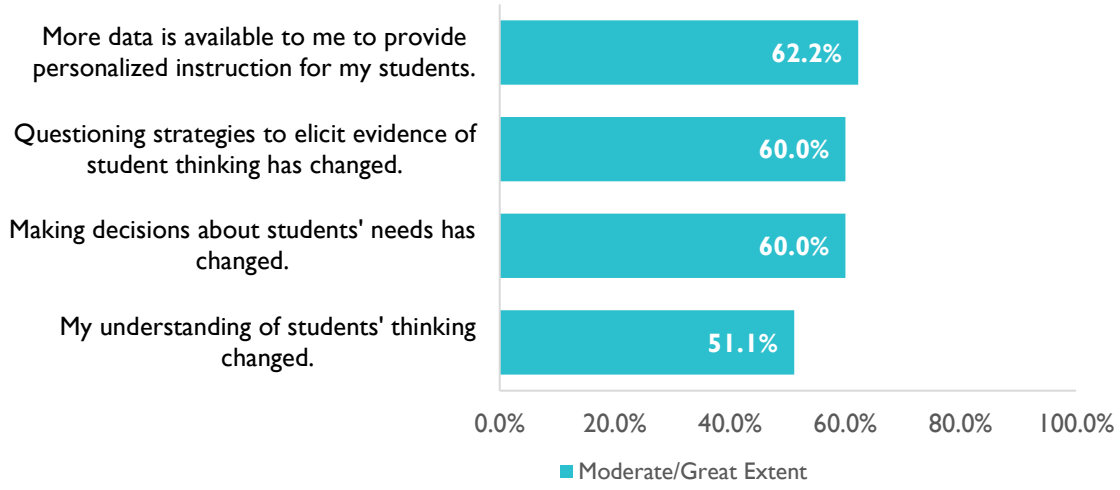

Figure 6. Impact of Learning Maps on Instructional Practice (*n* = 45)

Understanding of Formative Assessment

Forty respondents (13 ELA and 27 math) described changes to their understanding of formative assessment. The most frequent themes that emerged were the use of formative assessment methods, during instruction, increased awareness of student learning, and no change, but… (see Table C9 in the Appendix). A number of the respondents to this question (one ELA and nine math) said there had been no changes in their understanding.

Formative assessment methods. Eleven respondents (four ELA and seven math) said they learned about tools for conducting formative assessments. Respondents consistently reported that they listen to and question students more than they did previously. For example, one ELA teacher said, "I am more active in listening and questioning." A math teacher said:

> *I had a great understanding of what formative assessment is, where I struggled was giving meaningful feedback that moved students forward. I feel better equipped to know what questions to ask, and what to look for in their answers, to be able to plan next steps.*

They also said they conduct "more frequent, smaller assessments." Respondents further stated that they use "exit tickets" to assess learning. One math teacher shared, "It does not need to be a formal quiz or test to gain an understanding of students understanding of concepts. A good question, exit ticket, or one problem can be used to assess learning. It is more on-the-fly assessing of students."

During instruction. Nine teachers' (five ELA and four math) responses indicated that formative assessment is useful during instruction rather than as a standalone event. One described it as a process. Another said they view it as a "practice naturally embedded in instruction." In the words of a math teacher, "Formative assessment is ongoing assessment and helps teachers to modify

and adjust their teaching to match what the student needs." An ELA teacher said, "I now know that formative assessment is a practice that is naturally embedded into instructional lessons. I used to think formative assessment was a formalized assessment process."

Increased awareness of student learning. The five responses (one ELA and four math) included in this thematic area reflected teachers' capacities to quickly grasp where students are in their learning paths and what they need next to reach their learning goals. One math teacher explained:

> *I have done a lot of work on improving the quality of my teaching outside of ELM training, but everything that I have learned in ELM has validated the things I am striving to do. I find myself using formative assessment all along the way now and changing my teaching to meet the students' needs rather than just checking off who is struggling and not knowing what to do about it.*

No change, but…. Five survey respondents (two ELA and three math) said that while their understanding of formative assessment has not changed, they learned new strategies. For example, an ELA teacher said, "I had a pretty good grasp on formative assessment before ELM training so other than additional ideas no real earth-shattering change." One math teacher reported, "Not a whole lot of change in my understanding of formative assessment, I just now have more ideas of how to implement it using questioning and problem-solving."

Provision of Personalized Learning

Survey respondents also reported on the ways in which the ELM materials and learning maps have changed their ability to provide personalized instruction. Thirty-nine teachers (12 ELA and 27 math) identified using personalized learning as an instructional tool, noted specific changes in practice, and identifying and remediating student learning gaps (see Table C10 in the Appendix). Five teachers (two ELA and three math) said they need more practice with it because it is still a "growth area" for them. Three math teachers stated that their ability to provide personalized learning has not changed at all.

Personalized learning as an instructional tool. The largest proportion of teachers (five ELA and 15 math) reported they now use personalized learning as a tool in their classrooms. A small number of teachers (four ELA and one math) specifically noted that it was a tool to help them identify or remediate student learning gaps. One math teacher said that the maps "allow me to truly individualize the instruction for each student." Multiple respondents said that the ELM materials offer them road maps of students' instructional needs so they can "adjust lessons" and "personalize student learning paths." One math teacher said that now lessons are tailored to individuals or small groups, which allows for adaptive teaching strategies. Another math teacher said it helps instruction because the teacher now understands students' progression levels before they enter the teacher's grade level. The maps also enable teachers to provide more support for students who struggle and enrichment opportunities for those demonstrating mastery of concepts. An ELA teacher said:

> *The maps have allowed me to identify skills my students need to master before they are able to master the intended standard. The maps have also provided me with specific enrichment skills*

students can learn once they have mastered the intended standard. This research-based map has provided me with a solid tool for personalized instruction. In the past, I would do my best in identifying precursor and enrichment skills. Now, I use the map to identify these skills.

A math teacher said, "The maps help with individual instruction by providing a road map for individual instruction to see what students should have already learned and what they should be learning next."

Regarding how the maps have been used to identify or remediate student learning gaps, an ELA teacher said, "The maps have allowed me to identify skills my students need to master before they are able to master the intended standard. The maps have also provided me with specific enrichment skills students can learn once they have mastered the intended standard."

Changes in instructional practice. Ten teachers (three ELA and seven math) reported that they spend less time talking and more time for students to practice what they are learning. One respondent said that the "process for planning for all students is more exact and effective." Another said that there is an increased "intentionality" about which lessons to use to target student learning goals. One math teacher reported using the "math workshop model":

I am now using a math workshop model which allows the students to personalize the pace of their learning. Students work through lessons at their own pace while I use conferencing and small group lessons to do 'on the spot' differentiation. I am able to support my students who struggle with immediate interventions and challenge my students who need it with immediate differentiation.

An ELA teacher shared the way ELM units facilitate teaching and learning:

ELM has given me a way to teach in multi-grade level in a more profound way. In multi-grades there are also differences in levels. Large differences in abilities along with multi-graded classes creates a need for individual learning plans which take a lot of time.

Changes in Student Learning

Teachers were also asked to discuss the changes they observed in student learning as a result of their use of the ELM materials and learning maps, along with specific examples. Key themes that emerged included student ownership of learning, improved and deeper understanding, improved skills, and increased student confidence (see Table C11 in the Appendix). Thirty-two teachers (nine ELA and 23 math) answered this question.

Students take responsibility for their own learning. Eight math teachers reported evidence of students taking responsibility for their own learning. One math teacher said that students "buy in to their own learning" and another reported that students "enjoy tracking their mastery" of key concepts. The tracking, the teachers said, helps students understand that they learn and progress at different levels. The respondents also stated that students use rubrics to evaluate themselves, which helps them know where they are going next. Another math teacher stated, "Being able to see what

necessary skills the student is lacking gives them more ownership and helps them know what to make goals around."

Improved and deeper understanding. Eight teachers (one ELA and seven math) said students' knowledge and understanding of concepts and how they connect to one another has improved. An ELA teacher reported, "They can understand concepts on their own level and progress towards their personal goals. They are given on-target instruction by their aides." A math teacher provided a more specific example: "The Patty Paper lesson plan has helped students gain a better understanding of transformations."

Additionally, six teachers (one ELA and five math) reported that students had a deeper understanding of skills and concepts. One ELA teacher commented, "Student discussion and work was at a deeper depth of knowledge because of the ELM." A math teacher added, "Student responses are deeper because of the questions I am asking. Retention is better."

Improved skills. Four ELA and one math teachers reported improved student skill development. In ELA, this improvement was demonstrated through better reading skills, improved summarizing, and evidence that students use effective nonfiction strategies. One ELA teacher said that the summaries students wrote were "shorter" than they were previously, but they show a greater depth of knowledge and understanding. A math teacher reported students using problem-solving strategies that had been taught for the learning maps.

Some survey respondents described the skills students are developing and noted that they better understand where they need specific help. One math teacher said, "Instead of getting 'I do not get it,' I get 'I am having trouble with finding the common denominator.'" Three teachers reported that they saw growth in students, especially struggling students. One teacher wrote:

> *I have seen students grow in different ways after using the ELM software. I was teaching students how to multiply. I kept getting varying results until I looked through my ELM software. This allowed me to see, visually, the specific skills that I missed for my class. I had to teach students extended addition, the function of extended addition, and teaching students the relationship of extended addition to multiplication. I had missed this skill and I created classroom activities based on these nodes. Once students realized this relationship, they also understood turn around facts using manipulatives.*

Increased confidence. Four respondents (one ELA and three math) commented on changes in student confidence. Building on student buy-in for their own learning, teachers observed students "feel a strong sense of accomplishment" when they master a concept or skill. Furthermore, respondents said students' confidence and motivation to learn increased. This change in engagement, confidence, and motivation is occurring at the same time students' awareness about what they do not know is growing. One math teacher said, "I begin to see positive changes toward math from my students. They became more confident math students. They have been very excited to learn math since they are beginning to learn the functions and the concepts of math."

Mathematics Skills and Confidence

Mathematics teachers were asked via the survey to rate their skill and confidence levels in eight areas of instruction. As shown in Table 10, a majority of respondents (80% or higher) expressed moderate to high levels of skill and confidence in seven of the eight areas of math instruction. Nine out of 10 math teachers responding said they were moderately or highly skilled (93%) and confident (90%) in *"giving and evaluating explanations."* The lowest level of skill and confidence was given for the item "*examining correspondences among representations and solutions.*" Approximately three-fourths (73%) of the math teachers expressed moderate to high skill in this area and two-thirds (63%) expressed confidence.

Table 10. Skill and Confidence Levels in Mathematics Instruction

Please indicate your skill and confidence levels in the following areas of mathematics instruction						
	Not	Slightly	Moderately	Highly	*M*	SD
Analyzing errors made by students in mathematics tasks (*n* = 30)						
Skill	0.0%	10.0%	40.0%	50.0%	3.30	0.65
Confidence	0.0%	16.7%	33.3%	50.0%	3.33	0.76
Facilitating mathematical discourse (*n* = 29)						
Skill	0.0%	13.8%	62.1%	24.1%	3.10	0.62
Confidence	3.4%	10.3%	62.1%	24.1%	3.07	0.70
Giving and evaluating explanations (*n* = 30)						
Skill	0.0%	6.7%	46.7%	46.7%	3.40	0.62
Confidence	0.0%	10.0%	50.0%	40.0%	3.30	0.65
Appraising unexpected claims, solutions, and methods (*n* = 30)						
Skill	0.0%	20.0%	56.7%	23.3%	3.03	0.67
Confidence	0.0%	26.7%	43.3%	30.0%	3.03	0.77
Choosing and using representations (*n* = 30)						
Skill	0.0%	6.7%	43.3%	50.0%	3.43	0.63
Confidence	0.0%	13.3%	43.3%	43.3%	3.30	0.70
Examining correspondences among representations and solutions (*n* = 30)						
Skill	3.3%	23.3%	43.3%	30.0%	3.00	0.83
Confidence	3.3%	33.3%	36.7%	26.7%	2.87	0.86
Choosing and using definitions (*n* = 30)						
Skill	0.0%	13.3%	53.3%	33.3%	3.20	0.66
Confidence	0.0%	13.3%	60.0%	26.7%	3.13	0.63
Interpreting and responding to students' ideas (*n* = 30)						
Skill	0.0%	13.3%	53.3%	33.3%	3.20	0.66
Confidence	0.0%	13.3%	50.0%	36.7%	3.23	0.68

Cohort 1 and 2 Focus Groups

The teacher participants were asked to describe the impact their participation had on their teaching. As in the survey, they used the prompt "*I used to… But now I…"* As a framework for discussing the ways in which they have changed their instructional practices. Several themes emerged across the focus groups. First, teachers reported a **renewed attention to questioning as a**

teaching strategy. One teacher explained, "I used to give answers to questions, and now I lead them to the answers." Two other teachers shared similar experiences:

> *I am more about the why instead of, 'Here is the rule.' We were taught a procedure. 'Just do this,' and you do it over and over again, and you practice it over and over again. You do not have to worry about why. Just do it. If the problem looks like this, you do this, and if it looks like this, you do this. Now it is more like, 'Okay, well, this is why this works.' The best example is the negative exponent. Anything to the zero power equals one, and I used to say, 'I do not know why. It does not seem to follow anything.' Until I wrote it up on the board with a pattern and showed them the pattern, which leads into the negative exponents. It is that natural flow. What I have found is that I am more about why things are the way they are. When kids ask me a question I am less likely to give them an answer because the answer is not the important part.*

> *I think that I have always thought that questioning is important, and the right style of questioning, the right question at the right time. But these materials lay the questions out sequentially to build the kids' knowledge, and I cannot even imagine what it takes to create materials like this that are so—just the sequence of questions. I think sometimes the kids are even surprised by the time we get to the end of a day or two at what they are able to do because of these questions, these deep questions that they have been asked.*

Second, teachers shared examples of how they use the maps **identify and address gaps in students' knowledge** instead of simply trying a different approach to repeatedly teach the same concept. The following two examples were shared by teachers:

> *I used to just find another way to teach what I was teaching. For example, maybe I need to use manipulatives instead and help them out. But now I can go back and see what they are missing.*

> *You used to throw in, 'Maybe they just need another lesson. If I just picked out a better picture book. I just need a better piece of text.' Now with some of those questions you can pinpoint those misconceptions instead of just throwing another lesson at them. That is not really going to fix the problem. Now you are able to pinpoint maybe a gap or a missing link.*

Third, teachers pointed to how the **learning maps influenced how they think about the progression of learning**.

> *I think I used to focus my energies…more on my grade-level standards, and now I try to look at a much broader view of that vertical alignment [of]…where are they coming from and where are they going.*

> *I think it has helped because if I know that I am struggling with what the kids have, I can pull up the map and see where I need to take them back to.*

> *I think in my head I have always recognized the importance of that progression across grade levels, that vertical alignment. But the [ELM] materials put it in your hands. Not just I should know what the precursor skills are and the skills coming up, but they are there, and I can see them and*

access them so easily. I think that it is important for us as educators to really have a good grasp of where kids are coming from and where they are going rather than just where they are right now this minute.

I used to throw a dart at the standards and hope I hit where they are at (with their learning). But you know, when they had something that they were missing, you really did not know where to go with that. You had no concept of, 'What do I need to go back and teach that will help them to get here? I do not know what was back there. That was a second-grade or a third-grade or a fifth-grade skill. What are they missing?' …(now) I do not have to throw darts at the wall.

Lastly, teachers spoke about how they have **used the learning maps to individualize instruction** for their students, both at the advanced and remedial levels.

Whereas I left [the training in] Kansas really thinking about my advanced [learners] and handing [the content] to them, but a lot of my advanced learners are also more independent than my struggling learners…I left [the training in] Kansas thinking, 'How can I make little, small, independent groups, and how can we move forward while I am reteaching this or doing this other piece?' In reality, especially after that first year, what it helped me with the most was helping the struggling kiddos, and then I had the opportunity to go, 'Okay, how can we also use it for the advanced [learners]?'

It did help with MTSS and that is a big issue — trying to find things to figure out what to use with these students for MTSS and trying to narrow them down, exactly where they are at when you are teaching them.

Cohort 3 and Returning Cohorts 1 and 2 State-Level Trainings

An evaluation survey was administered to attendees of the state-level trainings held in January (Alaska), June (Missouri and Wisconsin), and July (Kansas). The first part of the survey asked respondents to indicate their agreement several different aspects of the training. Below are bulleted highlights from the training items organized by category (see Table 11 for additional detail):

Overall, the items were rated quite highly, with items pertaining to presenter quality and the training outcomes having the highest levels of agreement.

- **Presenter Quality:** Nine out of 10 respondents (95%) agreed or strongly agreed that the presenters were knowledgeable about the subject matter and were responsive to questions or concerns (94%). Eight out of 10 respondents (80%) agreed or strongly agreed that the presenters had good presentation skills.

- **Materials:** Nearly all respondents agreed or strongly agreed that the materials were relevant to mathematics or ELA educators (98%) and that the materials were research-based (97%). Slightly more than nine out of 10 respondents (94%) agreed or strongly agreed that the materials (including visual aids) supported the training goals.

- **Practical and Environmental Issues:** Nine out of 10 respondents agreed or strongly agreed that the meeting location was accessible (96%). More than eight out of 10 respondents agreed or strongly agreed that the seating was adequate and arranged appropriately for the activities (86%). However, slightly more than one-fifth of the respondents disagreed or strongly disagreed that the pace of the training was adequate (22%).

- **Objectives:** Eight out of 10 respondents agreed or strongly agreed that the objectives of the training were clear (81%). However, somewhat fewer respondents agreed or strongly agreed that the objectives had been accomplished (76%).

- **Content:** Nine out of 10 respondents (92%) agreed or strongly agreed that the topics covered in the training were relevant to the ELM project goals and that the training encouraged collaboration with peers (90%). Eight out of 10 respondents (84%) agreed or strongly agreed that they were already knowledgeable about the academic content taught to children that is modeled in the map and that the training created a sense of community amongst participating teachers (80%).

- **Training outcomes:** Eight outcomes were identified for the training. More than eight out of 10 respondents (85% or greater) agreed or strongly agreed that each outcome had been attained. The training outcome receiving the highest levels of agreement was that the training provided respondents with information and resources that can be accessed for future use with 97% of the respondents agreeing or strongly agreeing to this statement. Additionally, nine out of 10 also agreed that the training increased their knowledge of how to use the learning map resources (92%).

- **Quality, Relevance, and Usefulness:** More than eight out of 10 of respondents (87%) agreed or strongly agreed that the information provided was useful for teaching and of high quality (84%). However, there was slightly less agreement that the information was relevant, which was defined as timely and worth the effort (79%).

Table 11. Evaluation of Training by Item

	n	SD	D	N	A	SA	*M*	*SD**
Presenter Quality								
The presenters were knowledgeable about the subject matter.	229	--	0.9%	3.9%	34.1%	61.1%	4.55	0.62
The presenters were responsive to questions or concerns.	229	--	--	6.1%	24.0%	69.9%	4.64	0.60
The presenters had good presentation skills.	229	0.4%	6.1%	13.1%	43.7%	36.7%	4.10	0.88
The presenters included a variety of learning activities.	228	1.8%	8.8%	17.1%	38.6%	33.8%	3.94	1.01
Materials								
Materials were culturally responsive.	211	--	4.3%	33.2%	38.9%	23.7%	3.82	0.84

	n	SD	D	N	A	SA	*M*	*SD**
Materials included diverse viewpoints.	213	--	3.3%	31.9%	42.7%	22.1%	3.84	0.81
The topics and materials are relevant to mathematics and/or English language arts educators.	228	0.4%	0.4%	0.9%	35.5%	62.7%	4.60	0.58
Materials were research-based.	229	--	0.4%	2.6%	27.9%	69.0%	4.66	0.55
Materials (including visual aids) supported the training goals.	227	--	1.8%	4.0%	42.3%	52.0%	4.44	0.66
Practical and Environmental Issues								
Pace of the training sessions was adequate.	228	3.5%	18.0%	15.4%	38.6%	24.6%	3.63	1.14
Length of the training was adequate.	228	2.2%	13.6%	15.4%	43.4%	25.4%	3.76	1.05
Seating was adequate and arranged appropriately for the activities.	229	1.3%	3.9%	8.7%	41.0%	45.0%	4.24	0.87
Room temperatures were comfortable.	227	5.7%	20.7%	12.3%	38.3%	22.9%	3.52	1.21
The meeting location was accessible.	229	0.4%	0.4%	3.5%	40.2%	55.5%	4.50	0.63
Objectives								
Objectives for the training were clear.	228	1.8%	9.2%	8.3%	33.8%	46.9%	4.15	1.03
The objectives were accomplished.	229	0.4%	9.6%	13.5%	38.4%	38.0%	4.04	0.97
Content								
The training covered the range of topics I expected it to cover.	228	2.2%	11.0%	14.0%	37.3%	35.5%	3.93	1.06
The training addressed the topics in sufficient detail.	229	0.9%	8.7%	16.6%	44.5%	29.3%	3.93	0.94
The information presented was comprehensive.	229	1.7%	5.2%	14.8%	42.4%	35.8%	4.05	0.94
The topics covered in the training were relevant to the ELM project goals.	229	--	2.2%	5.7%	41.0%	51.1%	4.41	0.70
The training encouraged collaboration with peers.	229	--	1.7%	8.7%	40.2%	49.3%	4.37	0.72
The training created a sense of community amongst participating teachers.	229	0.9%	4.8%	14.0%	52.0%	28.4%	4.02	0.84
Prior to attending this training, I was already knowledgeable about the academic content taught to children that is modeled in the map.	227	3.5%	6.6%	6.2%	48.0%	35.7%	4.06	1.00
Training Outcomes								
The training provided me with information and resources that I can access for future use.	228	--	0.9%	1.8%	43.0%	54.4%	4.51	0.58
The training increased my knowledge of how to use the learning map resources.	229	--	3.1%	4.8%	34.5%	57.6%	4.47	0.73
The knowledge I gained from examining the learning map resources can be incorporated into my teaching.	223	--	1.8%	11.7%	40.4%	46.2%	4.31	0.75

	n	SD	D	N	A	SA	*M*	*SD**
I will incorporate the use of learning map resources into my teaching.	222	--	1.8%	11.7%	43.7%	42.8%	4.27	0.74
The training increased my knowledge in the use of learning map resources for formative assessment.	227	--	3.1%	11.5%	45.4%	40.1%	4.22	0.77
The knowledge that I gained on use of learning map resources for formative assessment can be incorporated into my teaching.	221	--	2.3%	10.9%	46.6%	40.3%	4.25	0.74
I will incorporate the use of learning map resources for formative assessment into my teaching.	221	0.5%	1.8%	12.7%	46.6%	38.5%	4.21	0.76
I understand the expectations for participating in the research aspect of the ELM project.	229	--	6.2%	9.3%	43.2%	41.4%	4.16	0.93
The training met my expectations.	229	3.1%	13.1%	16.6%	35.8%	31.4%	3.79	1.12
Quality, Relevance, and Usefulness								
Overall, the information presented was of **high quality** (i.e., grounded in research and best practice, and designed to meet adult learners' needs).	229	0.4%	5.2%	10.9%	37.6%	45.9%	4.23	0.88
Overall, the information provided was **useful** (i.e., applicable to my teaching responsibilities).	228	0.4%	4.4%	8.3%	42.1%	44.7%	4.26	0.82
Overall, the information and activities were **relevant** (i.e., timely, and worth the time and effort)?	229	0.9%	6.6%	13.5%	34.1%	45.0%	4.16	0.95

Note. Percentages may not sum to 100 due to rounding. *SD = strongly disagree; D = disagree; N = neutral; A = agree; SA = strongly agree, M = mean, SD* = standard deviation.* NA appeared as an option on the survey but were excluded from the analysis.

Second, the survey requested respondents to indicate their agreement to 10 questions related to the ELM software (see Table 12). Seven out of 10 respondents (73%) agreed or strongly agreed that they would use the ELM software frequently, and slightly fewer (65%) agreed or strongly agreed that the functions of the software are well integrated. Furthermore, six out of 10 disagreed or strongly disagreed that there was too much inconsistency in the software (61%) and that the software is very cumbersome to use (60%). However, more than half of the respondents (57%) disagreed that they would need a technical person's support to use the software. Respondents were also mixed regarding their responses on the complexity of the software, with 52% disagreeing that it was unnecessarily complex.

Table 12. Evaluation of ELM Software by Item

	n	SD	D	N	A	SA	*M*	*SD**
System Components								
I think that I would like to use this ELM software frequently.	225	1.8%	8.0%	17.3%	52.4%	20.4%	3.82	0.91
I found the ELM software unnecessarily complex.	224	8.5%	43.3%	22.8%	21.4%	4.0%	2.69	1.03
I thought the ELM software was easy to use.	225	1.8%	16.4%	32.0%	40.9%	8.9%	3.39	0.92
I think I would need the support of a technical person to be able to use the ELM software.	226	15.9%	41.2%	24.3%	15.9%	2.7%	2.48	1.03
I found the various functions in the ELM software to be well integrated.	226	--	6.6%	28.3%	54.4%	10.6%	3.69	0.75
I thought there was too much inconsistency in the ELM software.	224	14.7%	46.9%	26.8%	10.3%	1.3%	2.37	0.90
I would imagine that most people would learn to use the ELM software quickly.	223	4.5%	22.4%	29.6%	41.3%	2.2%	3.14	0.94
I found the ELM software very cumbersome to use.	223	12.1%	47.5%	23.8%	15.7%	0.9%	2.46	0.93
I felt very confident using the ELM software.	221	1.8%	19.5%	29.0%	40.3%	9.5%	3.36	0.96
I needed to learn a lot of things before I could get going with the ELM system.	222	7.7%	41.4%	21.6%	25.2%	4.1%	2.77	1.04

Note. Percentages may not sum to 100 due to rounding. *SD = strongly disagree; D = disagree; N = neutral; A = agree; SA = strongly agree, M = mean, SD* = standard deviation.* NA appeared as an option on the survey but were excluded from the analysis.

Successes and Challenges

ELM project staff and state partners were asked to reflect on the project's successes and challenges to date and were asked to describe how identified challenges had been addressed. Findings are summarized below.

Project Staff

In addition to being asked about project successes and challenges, project staff were also asked about their experiences working on the ELM project. They discussed the types of supports they need to successfully carry out their individual roles and responsibilities on the project and the degree to which their assigned tasks aligned with their job expectations. Described in this section are staff's responses to these areas.

Staff Support

When asked about the types of support they need to successfully undertake their roles and responsibilities as they relate to the ELM project, staff members were divided in their perceptions. Most project staff reported that **they have the necessary supports in place while some described what they feel are unmet needs or unrealistic expectations**.

Supports that were in place included "exposure to teacher feedback to know exactly what is working [and] what is not [working] with the software" and "exposure to content experts to know what will work for them as far as the research feedback…and their takes on how to design the map software in such a way that it is easy for them to use." Another staff member explained that they rely on "having a clear sense of what the requirements are, getting the feedback from teachers that are currently using this, getting feedback from our own staff" and that they find this feedback "really, really valuable because we need to make sure we are on the right track and doing the right things and having the right priorities in terms of development." This theme of "consistent communication" as a necessary support was echoed by another staff member who reported that they are being kept "informed of important procedures and decisions that affect my day-to-day activities as well as decision that affect the team and the project as a whole."

In contrast, other staff members indicated **that "clear, concise communication" is lacking and that their "energy…sometimes gets diverted by other things that I do not feel like are always necessary."** One staff member commented:

> *That is a big one for me, just [someone saying], 'This is what is going on, this is what is happening.' And then I do not think it hurts to reach out and [say], 'Is everything okay? Are you doing okay? How are things going?' I feel like to a certain extent that happens during the biweekly meeting, but it could be a little bit more prevalent, I guess. So instead of us just saying, 'This is where I am at,' maybe after that [having] a follow-up … [to say], 'I see that you have only completed one unit in the last two months. Is there anything I can help with? Is everything going okay? How can I support you?'*

This theme was echoed by another staff member, who expressed a desire for "more encouragement, more celebration, more excitement. Just some life, just like, 'Yeah, there is somebody out there, and we are moving this thing forward.'" Two staff members also indicated that some members of the leadership team can be "pretty distracted in [their] work" because they have "a lot of other irons in the fire." They reported that this makes it difficult when a staff member "needs[s] information…[or] responsiveness" from leadership.

ELM project staff were also invited to reflect on the alignment between their job expectations and the work they have been assigned on the ELM project. **The majority of staff reported that their assigned duties are "perfectly aligned" with what they expected and are "a good fit for [their] skill set**." Some staff members indicated that, because of the nature of the project, they "do not really have a very…specific" job description or they "did not have any expectations" for specific work. One staff member commented that the ELM project is different than other grant work in that "most of the grants have been with one or two people and not seven or ten people" and that is has been "interesting to work with so many people."

However, some staff members expressed that **the amount or type of work they were tasked with doing was different than they originally anticipated or had changed over time**. One reported, "I have ended up doing [extra work]…it has just kind of been pushed on to me…it has not really been assigned to me" while another shared, "I do not feel like I should have had to

have done [some tasks]." Two staff members also indicated that they type of work they have done (specifically, the content area in which they work) was different than what was in the job description. One staff member was neutral about this change and shared, "The last year…there was a bit of a bump-up in what my expectations were…[but] I do not feel like anything that happened was unreasonable or outside of my role." Two other staff members, however, perceived this change in a more negative light. One commented, "I feel like my job has really been more focused on [one area of the project]…when really I thought it was going to be more evenly shared" between two different areas. Another concurred, stating "I was asked to work on [one] part of this project…that takes away from some other things I am doing…I had to push back, and say, 'No, that is going to take too much time.' I do not feel like I should have to do that." Changes in roles and expectations due to project and staffing changes were also reflected by two staff members:

> *I feel like a lot is changing now at ELM as…three employees have left. I feel like my role is going to be changing a lot. So far, from what I can see, it is all changing for the better. It is…meeting my expectations [more], so I feel like I kind of just had to go where they needed me, and now I am doing more of the [tasks I anticipated doing]…I think things are improving.*

> *I would say [I need]…clear guidelines on my roles and responsibilities. I feel like it is kind of changing now, as we are shifting away from unit development, and we are shifting more into the final year of the project, and all that that entails, which is quite a lot. I would just say clear expectations would be really helpful.*

Successes

Project staff shared the successes they have experienced to date, including "the project as a whole," the quality and flexibility of the maps and resources, the creation and timely delivery of high-quality content, the summer teacher trainings, and building and maintaining relationships with teachers.

Above all else, a majority of ELM project staff indicated that **"everything" about the ELM project has been a success**, including the fact that "what we proposed actually worked and teachers found it really useful." Staff described the maps and resources as "high quality," "unique," "really very professional," and "more useful than I was expecting, or useful in more ways than I was expecting." Staff were pleased that they "were able to take the ideas that we had—to truly use learning maps as an organizing principle—to improve the software to make it easier for teachers to use it…The team just did a phenomenal job…of putting that all together." One staff member voiced a common opinion, stating, "I do not have a lot of things that I wish would change about that except…I hope we get a new grant, and we can do more with this."

The **quality and flexibility of the ELA and math maps and resources** were also described as successes by several ELM project staff members:

> *Developing this system that allows our staff to produce these maps and present them in a way that is really very professional and I think is really pretty easy to use [is a success]. And along with all the*

accompanying resources, it is a very… polished, professional-looking system that…works really well. It has its usual occasional bugs that pop up here and there, but for the most part, I think it has been a really stable, very useful tool.

The number of high-quality map views and accompanying resources that have been developed for a general education audience is astounding and I think it is terrific. That is major.

The different ways teachers use it, the different ways teachers tailored it to work with their own either classroom or their own teaching style, I was just so impressed. That is really been exciting to me to watch, to say, 'Hey, we are actually making a difference in the classroom. We are actually making it easier for this teacher to teach.'

Several staff members also shared that they consider the creation and timely delivery of "good, rich, research-based content" a success, including "completing the…math content" and "getting the math units out by the timeline that we said we would get them out." It is important to note that the work on the math map and units began prior to that of the ELA and therefore was more easily able to meet the timelines. In support of this theme, three staff members commented:

Having a good set of instructional units out there in math and ELA and improving those based on the feedback of the teachers [is a success].

I would say that creating units has been a big success. We are finished with the math units, and we are almost finished with the ELA units. We have two more to go.

We almost have all of the content done. I think there are two more units left for ELA, so I think that is a success…we [also] have a Student Locater Tool that is functioning…I think that is another success.

Two staff members also reported that the way in which the ELM project team has developed the maps and resources, through a process of continuous improvement and being responsive to teachers' needs, was successful.

I would say that one of the successes has been continually looking at our learning maps, saying 'Okay, is this accurate? Is this useful? Are there changes to be made?'…We look at that every two weeks, so I think that has been a big success.

Another success is that…the team as a whole is open to changing how we are doing things [because]…our goal is to make this useful for teachers. I feel like they are all really open to changes that do make this more useful for teachers.

Several other staff members concurred that the maps and resources were a success, and included the software itself in this category. One commented, "The website is good. There is good information [like] the teacher notes [and] the videos that [the project team]… have made." This staff member then added, "I think those [resources] have helped teachers…[understand] what the whole

unit is going to do, how it is going to do it, and what resources there are for the future…I think that has been a very important thing." Other staff members shared their enthusiasm for the software and the "awesome job" that the project team have done "to get the software to a point where it is intuitive for teachers to use and it is not cumbersome and the things that we have chosen to include have meaning and have made sense. I think the software itself with the maps has been a success." Another staff member concurred:

> *Getting the software together, getting all the pieces to work together in such a way that the teachers can use it [is a success]…It had to happen before anything else could happen, but it is still amazing that it all does. That would be a high point. That is not just a one-person thing; it is an entire team.*

Finally, one staff member added, "I hope that the…the Student Locater Tool will become a success. There is a lot of excitement about it, and I think what we have so far is leading us towards a success. Hopefully that continues."

A third theme revealed in conversations with ELM project staff is that many of them consider the summer teacher trainings as a success, describing them as "the high point" and at the "top of [the] list" of successes. One staff member shared that the trainings were "very, very successful, beyond what I thought they were going to be" and that "teachers that were excited to be there. Teachers that kind of knew what to expect, for those ones that just fit the project well, it worked. I mean, they understood our passion, it made them more in tune and more engaged in the training." One staff member who was not directly involved in the summer trainings emphasized the work that went into the 2018 trainings, stating, "I have a lot of respect for what they do…I think it is first-rate…and it has all been synchronized and everybody plays a part and they change it up. It has really gone well." Another staff member concurred, adding "There are things that we worked very hard at and got very [good]…at" as part of the summer training.

A fourth success described by the ELM project staff was **their relationships with teachers and the positive impact the ELM project has had on teachers**. The communication with teachers was described as "always very, very strong" and one staff shared "that for the most part, the teachers have really made the project a success." Staff members were also pleased by "how excited everybody was about the project after the training, how excited they were about the maps, and how much they thought they could use it in their classroom." This enthusiasm was also seen in "having teachers that have returned year after year." ELM staff members noted that "some of the relationships with the teachers, and the feedback with the teachers, just on content process, and formative assessment, it was just great. It was positive, just overwhelming."

ELM project staff also recognized that, despite the challenge of recruiting a sufficient number of teachers, those who participated were "so passionate and enthusiastic about the project and committed to using the maps and using the resources and collaborating and sharing it with their peers." One staff member also commented, "I would say one success would be the number of teachers that have responded [that] they have more fully understand the learning map concept and are able to incorporate into their planning and formative assessments in the classroom." In addition, the word of mouth among teachers was seen as a success. One staff member explained, "We have

had a lot of teachers talk about sharing it with their teammates or their colleagues." Finally, one staff member reported that, "The four Iowa teachers that we have that chose to stay on after the state decided to withdraw their participation…is definitely a success."

Challenges

Along with numerous successes, ELM project staff have also faced several challenges in the project to date. This section describes the challenges associated with balancing project priorities, adequately supporting teachers, correctly timing the delivery of content, producing high- quality content for both math and ELA, staffing the project team, and the challenges staff members anticipate in the year ahead.

One challenge mentioned by several members of the ELM project staff was **how to prioritize various aspects of the project,** including balancing what were perceived as competing priorities, balancing requests from teachers and state partners with project goals, and how to best plan project activities. Some staff members shared that, while the ELM project is "partly a research project, both from the perspective of [the graduate] students as well as the educational researchers involved," it is also meant to "develop a production tool" which results in staff members being pulled "in opposite directions sometimes." Similarly, balancing competing input from outside sources about the goal of the ELM project was mentioned as a challenge:

> *We started off doing a research project and continued to [get]…influence from outside that indicates this project is going to become a commercial one. [Because] the design for a research project is not close to the design for something you would produce commercially, that has been a fairly big challenge."*

This was echoed by another staff member, who reported that because "there are so many opportunities, so many things that we could be doing," the leadership team has had to make decisions and choices which "may have been the absolute best choices" but which left team members wondering "about what other choices we could have done."

Prioritization challenges due to limited grant funding and project scope, especially as it related to creating more content, was a theme expressed by several staff members. Staff members commented that while "feedback from our teachers [shows]…they always want more," the "funding just was not available." As two staff members explained:

> *[Teachers] want more units [so that] all of the standards have units…That is a challenge because we do not have enough time, people, or money to do everything. I think a challenge has just been establishing guidelines, or establishing these limits, and being consistent with it, and communicating that to everyone…I think that what we have created [so far] is really good, so I can completely understand why they want more, but give us more dollars, and we will do more.*

There is nothing in the proposal about how many tests [Student Locater Tool] we would provide, so we have been at a struggle with that. Getting enough tests for teachers to want to use it, versus having the manpower to create those tests is a challenge.

More broadly, project planning was mentioned as a challenge. One staff member indicated that the leadership team was reluctant to address "basic planning" issues so that they were "not jumping on something a year or two years" after it should have occurred. One staff member reported that such issues were "overlooked, or ignored, or never addressed" even though "multiple people have tried even when it is not their job." S/he expressed the opinion that someone should have been "opening the calendar and looking at the grant and thinking, 'Okay, here is what we should do.'" On the other hand, another staff member indicated that this conflict had been "navigated pretty well" and that the result was "certainly a success."

A second challenge revealed in discussions with ELM staff members was **how to best support teachers in learning and successfully using the software and resources.** The initial challenge of training a diverse group of teachers was described by one staff member who stated, "Taking teachers with a whole different variety of [teaching perspectives and backgrounds] …and trying to make the professional development match and be the best experience for everybody" was difficult. Another staff member concurred, adding, "At the beginning…we did not have a lot of experience with how to teach people how to use [the maps], they just made sense to us because we were steeped in them. At the very beginning…we were very theoretical in how they should work, and how they could work, and at this point we have a lot more information about how they do work." Related challenges arose as a result of the decision at "the very beginning" to ask teachers to "identify themselves as somebody who would either use the…the math resources or somebody that would use the ELA resources." ELM staff reported that they eventually learned that "elementary teachers…may want to use both [and that] they did not want to necessarily be restricted to just one or the other." In addition to these initial challenges, "scaling up the training sessions to work with the larger groups in the third year" was also seen as a barrier to the success of the project.

ELM project staff noted that they "certainly needed to provide better support after that first year…so [teachers] knew where to go when they had a question." They also noted that it has "been a challenge to stay in communication with all of the teachers" and that they "could have done a better job of getting teachers familiar with teachers that were teaching in the same grade levels" so they could support and learn from each other. Several staff members reported that changes made to the project after the first year were a direct result of feedback from teachers. For example, in Year 1 teachers were required to implement all of the lessons in a unit. However, the ELM project staff changed this requirement "because we were finding that a lot of teachers were not doing anything, or were not reporting anything, because they had not done the whole unit. [After that, staff decided], 'Gosh, if we make these a little bit more modular for teachers…maybe that will encourage them to use them more.'"

Along these same lines, ELM project staff noted that a third challenge was **appropriately timing the delivery of content and resources to best support teachers.** One staff member

commented, "Teachers certainly do not arrange their lesson plans around when certain units are available. There were times when we would publish a unit and the teachers were like, 'Well, we taught that last month.' And then we would not get any feedback on that unit for the rest of the year." This staff member indicated that the ELM project staff "learned a lot that first year, so we were much more planful in the second year about the timing of when we released different resources and trying to recognize, typically, when are things taught early in the year versus later and decide how to structure our development in that order." Another staff member shared:

> *When we first started developing the ELA resources, the decision about…which units to develop first was pretty much left to the university researchers…I am not sure what their specific rationale was for what they selected to do first, but what I would have recommended…would have been to gather some scope and sequence documents from…school districts within our partner state to get an idea for the sequence of instruction at the different grade levels so that the units would have been rolled out timelier.*

A fourth challenge described by ELM project staff **was producing high-quality content in both math and ELA while recognizing and working around the inherent differences in the two content areas**. As one staff member shared, "The effort that has been put into the math [units]…since the beginning of the project has always been different than the effort and focus that has been put into ELA." This disparity in content impacted teachers, in that ELA teachers "did not have a ton of units available for the upper grades." There were "teachers in our project who did not have any materials to use." Another staff member indicated that "math is a little more discrete and easier to create maps for than ELA [and] that teachers have any easier time using" the math resources, something that another staff member traced to the origin of the ELM project and the Enhanced Assessment Grant (EAG):

> *One [challenge] is just getting our arms around the difference in the content, between math and ELA. The EAG proposal was written by somebody with a math background and I think there may have been sort of [an assumption]…that the ELA content would be malleable in the same way as the math content…and [that] the concepts would align the same way. That is not the case. The ELA [content]…does not walk, talk, or think the same way as math.*

These last three challenges (how best to support teachers; appropriately timing the delivery of content and resources; and producing high quality content in math and ELA) **were reported to have been "looked at and addressed in some form or measure by the ELM team.**" One staff member indicated that "when the teachers said, 'We need training on this,' they set up some webinars…the teacher would say something like, 'I needed help and I did not know what to do. When I finally called [the ELM team], I got help. Not only that, they came out to my school and helped me plan my unit.'" In addition, the ELM project staff "started creating Word documents rather than PDFs so that teachers could better use" the resources. Updates or repairs to the software were carried out not only "through teacher feedback" but also with teachers' schedules in mind, so that releases are only done during the summer or winter breaks. However, one challenge "that has not necessarily been addressed" is the "difference between the state of the math maps and the state of the ELA maps."

A fifth challenge mentioned by three ELM staff members was related to **staffing, the "division of labor," and "inconsistency on holding people accountable"** which has resulted in "low morale with people that are held accountable for things" while others are not held to the same standards. One staff member shared a perception that the decision of "who is responsible for what has been a little" difficult "because some of the stuff that we are doing is not [part of] a strategic plan" and the "scope of work is not really lined out well in advance in order to ensure that there are definite roles for people to play." Another staff member concurred, noting that "waiting on clearance from people who are too busy" to make a decision impacts his/her ability to do his/her job successfully.

A third staff member indicated that "having the right balance of people working on the project was a challenge" that can be traced back to the beginning of the project. Initially, the perception was that "practitioners" would be best suited to serve as project staff. However, it later became apparent that "while we clearly wanted people with practitioner experience instead of just university researchers who had mainly theoretical experience," a balance of the two was necessary to ensure the success of the project. Finding this "fine balance" was made more complicated by the perception that staff members who were "fresh from the classroom" and who came "to the university setting may not have a bigger system focus because they do not have that experience."

Some ELM project staff also commented on **challenges they see ahead in the final year of the project.** They described the challenges that occur "as you wind up the final year of any project" as including "monitoring the budget carefully [and] making sure that you have the time and dollars necessary to get all the final reports put together" as well as being able to "stay involved with the teachers, to follow up with the teachers, to get our state partners to follow up with their teachers and to spread the word that all the units are out there." The final year is anticipated to be more difficult than previous years because the ELM project will not facilitate additional teacher trainings and is "not paying teachers for [their] feedback, but we have to get that feedback. It is critical to the success of this project." The end of the grant funding was also reported to have affected staffing:

> *Some people have left because they could see the handwriting on the wall and they know that in this four-year grant. There is an ebb and flow to the work to be done. We ae now at the end of Year Three…and the work is flowing into a different phase of the grant [which] is an impact analysis and that there just is not work for them.*

Finally, one staff member summed up the challenge of ensuring that the project is sustainable, a topic which is covered in more depth in the Sustainability and Scale-up section of this report:

> *I would say the main challenge that is still there is…making the final project be something that is fairly manageable for some school system somewhere to just download on their own and bring up and run…That is part of moving from something that has a heavy research focus developed in an academic environment to something that is truly production quality and can kind of standalone. Because…as much as we try, universities are not development houses. We are not software development houses…that is not our primary function. We ae at this stage where we ae trying to make that transition, to try to say, 'Okay, we have got this great tool, but now we need to package it*

and make it available in such a way that people without a lot of really specialized experience can bring up.' That is probably one of our big challenges right now that we are facing…We will do it. It is like there is a fear that we cannot, but it takes some time and effort and thought and cooperation with different people.

Individual staff members also pointed out additional challenges, including those inherent in "the normal management…of a large multi-faceted project with somewhere between four and five states…[with] each having their own opinions and trying to manage them and keep them marching…in a single direction." In addition, the challenge of addressing varying state standards was discussed by one staff member, who explained that the "instructional units…teach to specific targets or standards and when someone uses other standards, they are questioning whether these units are really what they need." This staff member reported that the ELM project team has "worked to look at the other standards in other states and see what they could do to adapt or make sure what they were putting out there…was aligning also to their standards." Lastly, one staff member indicated that transitioning the software "from an admin copy to modern copy and just tweaking it" was a challenge that was successfully addressed by the technology team.

State Partners

State partners were invited to share their successes and challenges to date. This section describes state partners' responses in these two areas.

Successes

The state partners described **several areas of success related to the ELM project, the quality of the software and resources, project implementation, and increases in teachers' knowledge of state standards.** One state partner reported that "the resources are really good," another shared that "the units that they have developed [and]…the maps" have been a success, and a third indicated that s/he was "overly impressed with the web-based information," which was "quite impressive." One state partner went on, commenting, "The maps, especially in mathematics, seem to be popular. I think that they did a good job in developing the lessons they have done." Two state partners also summed up the success of the project as a whole:

I think that [the ELM team was] right on track. I think that if nothing else, they improved on what their original idea was. It was, 'I think we are going to do this,' and then, 'Let us try that.'…They were always striving…to make everything better. Even though the original idea was great, the end product I think is better than what they had anticipated it was going to be.

I think that they have done a great job on [reaching the goal of the project] and I have seen or heard examples where the teachers have picked up and are thinking about developing their own maps to go along with it.

One state partner described the success of the ELM project in **increasing teachers' knowledge of state standards** and shared that it is "really good professional development as to what the standards are." This state partner explained:

> *We have had such positive feedback from teachers [on their]…awareness of what the standards are really asking…The tool itself breaks [the standards] down into such a way that it is digestible and [even when]…maybe they did not think that there was that much in the standard. One of the conversations that we have [with teachers] is that, 'Okay, we have our standards measure this at this depth of knowledge, and our assessment measures that standard at the same depth of knowledge. If the students are not doing as well on the assessment as you think that they should, where is the disconnect?' What the maps themselves provide is that breaking it down into pieces. [A teacher might say], 'Okay, if I read it and I only do this much, and I do it at a depth of knowledge one, am I really covering that standard?' And the answer would be no. How do you get it richer? Then you add in…the teacher resource, where it talks about the progression and how do you work on individualization, and what are the things that need to happen. Just that piece provides some insight as to what that standard is really asking for.*

Finally, one state partner reported that "**having Margaret Heritage involved in all the trainings was helpful**" and that teachers "got a lot of that pedagogy in the introduction and everything from Margaret Heritage."

Challenges

The state partners also discussed challenges associated with reaching project goals, **including recruiting enough teachers, time constraints faced by teachers, and competing state priorities**. The challenge discussed most often by state partners related to recruiting the required number of teachers each year. As one state partner stated, "I do think the challenge was recruitment." This was supported by two other state partners, one of whom indicated that "communication is a problem, and it always has been…with the teachers." Two state partners shared their experience with trying to recruit a sufficient number of teachers:

> *The biggest challenge is getting teachers involved in [the project]. Because there is not a real great way to communicate with all of them…[and get] information out there in a way that would get them more interested. I think that if we could sit down and talk with a group of teachers and explain to them what this is, I think they would be interested and excited about doing it …We have limited ability to communicate with all the teachers, and what we send out is all usually written. And that sometimes is easy to just ignore, because they do not always have time to read all that to try to understand what it is.*

> *How we facilitate growing the program was a challenge. You get the people who respond right away, 'We will do it.' But how do we get those teachers [who believe in the project] to communicate how good the program is, to get more people involved? And I think that is probably a challenge for us always.*

Along these same lines, one state partner reported that **communication problems between ELM project staff and potential summer training participants impacted the number of teachers who attended**. S/he commented that "we could have had a lot more teachers [for the training]…but for some reason the communication [from the ELM team] to let them know that they had been accepted kind of failed in a few cases…When you work hard at recruiting and something does not happen…that is kind of disappointing in some ways."

A second challenge mentioned by the state partners in reaching project goals was the **constraints on teachers' time and the difficulty they face in implementing new materials in their classrooms.** As one state partner stated, "Teachers are just asked to do a lot of stuff. I think it is really hard when we ask teachers to give up their time, because they only have so much time to give." Another state partner shared that, "for the teachers who are participating in the study, was that they were so good, they took so long [to implement a unit]." This state partner went on to explain, "In some districts, the curriculum directors and the leadership has found a curriculum that they want the teachers to adhere to with fidelity. When we bring in something that is possibly better …[fitting] that within [an established] pacing was a challenge for some of our teachers."

Finally, one state partner indicated that **ELM being one of "a couple other initiatives…at the department"** has caused some confusion and that "we are not really sure how [the ELM project] fits in with the other initiatives."

Communication and Collaboration

As part of the ELM project staff and state partner interviews, individuals were asked about the communication and collaboration among ELM project staff and the state partners. ELM project staff were asked additional questions about the internal communication, collaboration and support amongst its staff. Findings are presented below.

Project Staff

Members of the ELM project team were asked about their experiences with internal communication and collaboration amongst staff members as well as communication and collaboration amongst staff and state partners. They were also invited to provide a satisfaction rating for both areas. Lastly, they were asked to describe the ways in which input provided by state partners and Governance Board members was taken into consideration. This section describes staff's responses in these three areas.

Internal Communication and Collaboration

Project staff reported that they **continue to meet on a biweekly basis to share project updates and upcoming tasks**. The technical team also meets together weekly with one research/content team member.

We have an official team meeting every two weeks…where we debrief and discuss things such as this is where we are at with content creation…and doing an overview of what is happening officially on the project.

We have bi-weekly meetings for the entire staff…and then we have more within-team meetings... [for example] the ELA people will get together.

The technology group meets once a week to touch base and talk about what [they] did last week, what the problems are, and this sort of thing…[and] the entire local group meets once every other week. [The technology team gives a] a technical summary and then [the project staff] give summaries of what they have done in terms of map development, resource development, and so forth. We ae all kept pretty well in sync, and we have a really good liaison between the technical group and the development group. We have one person who does a lot of content development but also meets with us every week in our technology group. S/he has been really helpful in helping bring that perspective into the technology side.

Several staff members also reported **having frequent and email, online, and face-to-face discussions**. Perceptions about the extent to which communication and collaboration among staff members were effective and productive were mixed. Some staff members described the communication among the research/content team and the technology team as "constant" and "really good," as evidenced by comments such as:

The reaching out for…brainstorming or…getting feedback from somebody or [saying], 'I have an idea' [is beneficial].

We had some problems earlier this year with one of our technology people that was just having a little bit of problems on the software development side, and I think maybe it caused some communication problems, but he has since left the project. I think now, things are really going well. I am quite happy.

I think we are all willing to work with each other and we work together really well. There has never been an instance or situation where any of us has shied away from working together or communicating with each other. I think we are all pretty open and willing to talk about anything and present and problem solve if we need to problem solve or plan things out if we need to plan things out.

I think everybody that works on staff now is a really good team. I think we all support each other, and I think we all have the same end goal and are willing to work towards achieving that goal. I think our trainings that we had this summer are a good testament to that, because we did really work together, and brought all of our talents in to ensure that we had successful training, and I think we did.

Two staff members gave examples of the ways in which the **ELM project staff communicated and collaborated as it related specifically to the teacher trainings**.

I think on a whole, we communicate and collaborate really well, and like with the trainings we would meet at least once a week kind of leading up. The week before the training we met I think on three days and collaborated four good solid hours prior to the training just to make sure that we were ready.

[The project staff] took a lot from our first two…trainings and said, "How can we make this final year of training the best possible?"…they had some phenomenal ideas. Not only did they do a good job…collaborating before the first training, they took everything back from Alaska and said, "Now how do we make it even better for… Missouri?" Then from Missouri, "How do we make it better for Wisconsin?" After every single training there was still a debrief just to say, "How do I make it even better for the next one?"

However, other staff members expressed **concern about what they see as inconsistencies in communication.** Several ELM project staff noted that they "have to remember to ask questions" and that there are "a few communication problems where you are confused about what someone meant in an email and you cannot get confirmation" because "a lot of times people work from home, which makes it hard to have a face-to-face conversation and know at any given time where someone is going to be." One staff member explained that "projects like this that are very interdisciplinary" often have "problems with 'Well, what do you mean when you say that?'…[and] I do not think this one has been really unusual in that regard. We have had our share, but we have dealt with it and we have moved on." Other staff members, however, indicated that they have more serious concerns:

[Communication has been] inconsistent. There are times when our communication is very strong, most notably those times leading up to trainings and to large meetings where we are all working together to prepare for something coming up. There are also times where it is almost impossible to get a hold of anyone ever. Their response times on emails are slow and they are off doing their own thing.

I try and respect what everybody's job assignment is so that I am not impinging on it, sometimes I think I get frustrated because…things are happening that I do not know about.

[The ELM project staff used to create] a mostly internal report but that kind of ceased as they got busy with trainings and then they turn around and have to do reimbursement and they have to get the surveys and get the teachers set up for the next group and then there would be reimbursements. …I think it was an overload. It was just a tremendous overload…[for] the person that had to do this and [as a result] communication just ceased, which was sad because s/he was overwhelmed.

Several project staff stated a **desire for more communication between the leadership team and the research/content and technology teams**. The following two examples support that theme:

I would like more communication from project leadership…I just think more consistent communication about the goals, as they change, what we should be working on, their expectations for

us. I am one who I really like communication about job expectations and how I am meeting those expectations. I would like more of that.

I would just like more communication, more collaboration, too. I feel like, especially with leadership, when they are taking on a new project or a new part of this, they often just say, 'I am going to work with so-and-so,' but I would like more, 'This is what we are doing. Would you like to help with it?'

One staff member also reported that, "because we are all working electronically and we are sharing documents and we are storing documents," team members have faced some challenges in "document storage…document naming…protocols for all of that." This staff member shared, "if we could go back and wind the clock back and do anything else differently, I would have established protocols for that earlier on."

When asked to rate their satisfaction with the team's internal communication and collaboration on a 5-point scale (where 1 is not at all satisfied and 5 is very satisfied), ratings ranged from 3 to 5.[7] **Half of those staff (*n* = 5) who provided a rating gave internal communication and collaboration a 5 out of 5,** indicating a very high level of satisfaction. Select comments from staff who gave a rating from 3 to 5 included:

I think on the whole as a team, we have really good strong communication and collaboration amongst all of us…It has actually [been] a really, really great group.

I would say that the [the project staff] collaborate well and…communicate very well…I think we communicate regularly and well.

With the coworkers, it is positive. Daily communication, really good collaboration, we all work together really well, and bounce ideas off of each other.

External Communication and Collaboration

Project staff also shared details of their communication and collaboration with state partners and their perceptions of these collaborations. The described **how ELM project staff communicate with state partners, including monthly phone calls, webinars (referred to by some staff members as "video conference meetings" or "virtual meetings"), and annual meetings**. Two staff members described ELM project staff members' participation in the webinars:

As a staff we would sit down and decide if there was anything that we needed to include in [the meetings]. We would often attend the state partner meetings but were not necessarily very active in sharing information. If there was something that we were contributing to the slide deck or the

[7]Ten project staff provided a rating on the team's internal communication and collaboration; ratings were as follows: 3 (n=2), "3-4" (n=1), 4 (n=1), 5 (n=5), "3-5" (n=1).

presentation, we might speak on it, but…we were not necessarily the most active, strongest participators in that communication and collaboration.

[ELM project staff] have presented…status updates on what they are working on during our partner phone calls…In the first year they were monthly and…the second year, they were about every other month, and last year about the same. I do not know if we will continue those state partner calls or not.

Project staff also referenced attendance at the Governance Board meeting in September where they "each [had]…a part in presenting something."

Several staff members indicated that, although there are mechanisms in place for communicating and collaborating with the state partners, they do not "have a lot of communication or collaboration" with them and "have not had very much contact with the state partners." They explained that this communication is "outside of my experience" and "really not a huge part of my job" and that the co-Principal Investigator and project manager do "a lot more of the communication with the state partners." One staff member expanded on this idea, stating, "I feel like [the project manager] communicates with them a lot to keep them updated, to get their feedback, just to keep them informed about what is going on with our project, and also what is going on with our state trainings that were this summer."

Another staff member confirmed that "project staff just really do not have that much contact. That has not been their job. Their job is to create resources and to interface with teachers." Likewise, a third staff member indicated that ELM project staff have "been held at arm's length from communicating with state partners" noting that "that has always been the project director and the PI's role."

Several ELM staff members shared concerns about lack of state partner engagement, some of which was attributed to "changes in state partners…some have left and gone on to other positions and so it has been [challenging]…to make sure we are communicating with everyone." Two staff members shared that "some of the communications that used to go on have kind of ceased" and "it seems like it is just [following]…a protocol [where people] go through the motions and actions of what we think this is supposed to be." One staff member did acknowledge that "the state partners helped us a lot by…recruiting participants to come to the training."

Finally, several staff members recognized that "there is room for improvement on all sides" and suggested that "we just need to…keep the state partners involved." They described some state partners as "too busy to care" and "very passive when they show up" while others were "excited" and "very involved." Staff members went on to explain that these varying levels of engagement and enthusiasm were reflected in recruitment and participation in the project on the part of the state partners. Staff members expanded on these comments as follows:

They signed on [to the state calls] out of politeness…and they listened like sponges and just took in whatever we presented, but whenever we tried to encourage participation…we did not get a lot of feedback out of them.

Some of the states want to be more involved than others. Some are very passive in that they show up, they listen, that is about it. I think the states took varied roles in helping us with the recruiting. Some were very involved, some not and…that actually showed up in the number of teachers who showed up for the different trainings. Some are very proactive in finding other opportunities to use the software. Others, it is just one more thing they are doing, so it depends on the state.

I wish we could have done better, but knowing everything states have going on, I am not sure there was much else we could have done…If we could have had sustained engagement from them throughout the project, rather than the periodic touching base, I think it would have been easier to get more teachers involved and really scale this project up faster…It comes down to individual states and [some states]…stand out as having really gone above and beyond to have us reach more teachers…and run additional trainings, and they are really trying to push scaling this up within their states. When you have states that are truly acting as our partners, it really is helpful, as opposed to a state who is more about, 'What do you need from me now?'

When asked to rate their satisfaction with the team's external communication and collaboration with state partners on a 5-point scale (where 1 is not at all satisfied and 5 is very satisfied), ratings ranged from 2 to 5.[8] Select comments from staff who gave a rating from 3 to 5 included:

I think it is really well-done, with the meetings, the regular meetings. I think that we do integrate their feedback consistently. [Rating of "5".]

I wish we could have done better, but knowing…everything states have going on, I am not sure there was much else we could have done. [Rating of "4"]

I think everybody that we have worked with is passionate about this project and wants it to succeed in their state. That is something that I got overall from everyone, from every state partner. [Rating of "3."]

Probably the only thing would be [reason for a "3" is] the frequency with which the state partners join for the state partner calls. And it is just coordinating schedules among the different states.

We communicate with the state partners in terms of newsletters, on a quarterly basis, include them in all the newsletters we send to the teacher participants, and also include them in the annual governance meetings. [Rating of "3."]

[8] Ten project staff members provided a rating on the team's external communication and collaboration. Ratings were as follows: 2 (n=1), 3 (n=3), "3-4" (n=2), 4.5 (n=1), "4-5" (n=1), 5 (n=2).

Input from Governance Board Members and State Partners

Project staff were **divided in their opinions on the degree to which input from state partners and Governance Board members is taken into consideration**. Some project staff reported that the team "consistently" integrates feedback from the advisory board and state partners and that the feedback is "heavily weighed" and "taken very seriously." One staff member reported that staff members "come back after [the governance board meeting] and we have a debrief among staff…planning for…the upcoming year." This staff member explained that the staff discuss, "Here is what we have intended to do. Here is what we have heard. Here is what we need to modify or enhance or whatever we might need to do [or] change."

Along these same lines, several project staff shared that **feedback from state partners and advisory board members was especially important in developing the Student Locater Tool, teacher resources, and teacher trainings**:

> *Last year [the state partners]…had a lot of feedback and input for us about the design of the Student Locater Tool…they had a lot of input about that, and questions. They had input about the design of our resources that go along with the maps, particularly for ELA, and suggested that we include our own [reading] passages rather than asking teachers to locate them…They have been very receptive to hearing the teacher feedback that we have gathered, and I would say that at various points they have given us things to consider.*
>
> *Some of the input and guidance that we got about the Student Locater Tool was either implemented or heavily weighed in the decisions that we made about that part of the project.*
>
> *I think it is taken very seriously. It has certainly led us to take a look at how the software works in response to things they have suggested…things that they find confusing or things that they want to be able to do that they cannot. We have been pretty responsive I think in developing the software in such a way to deal with those.*
>
> *I think that input from the state partners on the training has definitely been taken into consideration, about not only relatively simple things like when we are going to have the training, and where we are going to have it, but more complicated things…such as what content we should cover in the trainings, and things like that.*

Two staff members also described the process by which **feedback from state partners was also used to guide the creation of state-specific standards crosswalks**:

> *We have also used state partner feedback throughout the past year to guide our actions. For example…[the work] on [state-specific] standards crosswalk [is a result of state partner feedback]…Originally, [all of the states] had Common Core standards. Now, a lot of the states have modified versions of the Common Core. We have created these crosswalks that [show], 'If you are in Missouri, you can, in your preferences, set Missouri, and it shows the Missouri standards and how that lines up with the units that we have.' That all was…initiated from state partner*

feedback…it is something that we listen to repeatedly. I feel like our leadership…really take [the state partner feedback]…very seriously…and [they] really do emphasize that.

Everything the partners say is taken very seriously and followed up on and worked through…. [For example]…it became imperative—unexpectedly—to have a concordance between the individual state standards as they started veering off from the Common Core standards, and…that required lots of communication [with the state partners]. It all seemed to go on successfully.

Two staff members indicated that the ELM project staff highly values feedback from the state partners and also **understands and respects their limited time and busy schedules:**

The state partners' input is very important with each meeting that we have because we are working to help them be successful at their state. Unfortunately, our state partners are like any other government workers in that they are very busy. They have many hats to wear and sometimes they cannot all make the meeting.

[The state partners'] input is important because we can only do so much, especially when it comes to the recruiting issues. Then it is up to them to figure out how they are going to do it and [then to actually] do it…They do not have a lot of time to give to this, so what they do give us is very important. What we need to do to support them is extremely important, and I think we have made a good faith effort to do what we can do.

Two staff members **indicated that "state partners' requests are given too much weight" and that this happens "sometimes without [the ideas] really being evaluated."** One staff member reported that the ELM project team sometimes promises work without a process that answers a series of questions: "A) Is that part of the project? Is that in the scope of work? B) Is it something that we can even do? Then C) How is that going to be an important thing for everybody else?" This staff member continued, stating:

This is just one person that made one request. Just because they asked for that, does not mean that we have to do it. I feel like there has been a lot of those instances that have occurred that have caused extra work on the staff's part that was unnecessary. It just could have been, 'Somebody asked for this. What do you think?' It is never that. It is always like, 'Oh yes, we will work on that.'

One staff member indicated that the **state partners often asked for guidance from the ELM project staff**, saying, "There was often a lot of, 'Tell us what you want us to do' on [the part of the state partners]. They were coming to us and asking us what they should be doing, and so…that was put back on us…and that was a little bit frustrating."

In contrast, another staff member reported that **ELM project staff ask for guidance from the state partners** on the best way to implement the project in their states:

We are needing to collect data to run some of the studies that we put into our proposal. And so [we ask them], 'What is the best way to get assessment data from out of your state?'…Then we will

follow their lead on how to do that. Or, 'What way should we use to recruit teachers from your state?' Or things like that where we have specific questions for the state or they have specific advice for us on how to work within their state, we take their lead, always.

Finally, one staff member expressed concern about **the ways in which Governance Board members' expertise is being used on the project.** This staff member wondered "whether we could have engaged our advisory group more often in technical ways. I know some of them were…quite involved…Margaret Heritage and Karen Carp were both very involved." S/he went on to explain, "Our other advisors were more passive and primarily just came to the annual meeting even though they got an honorarium for being part of the team." This staff member suggested that the ELM project staff could have "offered them something in terms of, 'This is of interest. Can we give you any insight into this for an article you want to write?' Or maybe even encourage or seeking advisors [not only] for their expertise, but also people who have an interest in publishing on the topic."

State Partners

State partners were asked to describe their experiences with communication and collaboration with ELM staff members. They were also invited to provide a satisfaction rating in this area. State partners' responses in this area are described in this section.

Communication and Collaboration

When asked to rate their satisfaction with communication and collaboration with ELM project staff on a 5-point scale (where 1 is not at all satisfied and 5 is very satisfied), **ratings were universally high.** One state partner rated the communication and collaboration as a 5 (very satisfied) while two other state partners rated communication and collaboration as a 4 out of 5. These two state partners explained that gave a rating of 4 out of 5 because "sometimes you have to wait a little while for them to get back to you" but one state partner went on to point out that the communication is "always very pleasant, and it is always thorough, and they answer everything I need to have answered."

State partners also expressed high opinions regarding collaboration with the ELM project staff. One state partner reported that working with the ELM project staff "has been very collaborative" and noted that "when we provided some input about what we felt strongly…about this course and this type of questioning, they really incorporated that" into the project. This staff member went on to describe the ELM project staff as "very open to any ideas we had, even just in the development of the resources."

The methods by which the ELM project staff communicate with the state partners elicited varying responses. One state partner shared that "the monthly webinars where we would call and have conversations were very helpful" and another reported that his/her communication "has been limited to the webinars that they have been hosting, and emails back and forth." However, another state partner reported having "mixed feelings" about ELM staff members' communication. This state partner noted:

I have mixed feelings about that part…we talked about having a newsletter…we have talked about different ways of communicating [but] I felt like in the second year, we did not hear anything [from the ELM project staff]. And then, all of the sudden [they said], 'You have got to recruit, recruit, recruit,' and I am thinking, 'Well, where have you been?' This year was better, but it seems like once they get the recruitment done...we will have a monthly meeting, but it seems like they kind of forget about the state [partners].

Finally, one state partner shared that s/he was not an active participant in communication with the ELM project staff, stating, "They are wonderful, and I am terrible. They let me know everything and I am thinking, 'Great, I know what is going on.' I am not necessarily participating, but I know what is going on."

Sustainability, Scale-up and Replication

As a part of ELM project staff and state partner interviews, individuals were asked about plans for sustainability and scaling up the use of the Enhanced Learning Maps and resources following the conclusion of the Enhanced Assessment Grant. There were also asked to discuss ways in which the ELM project could be replicated for use in other states and what would need to happen for other states to successfully use the maps and resources. Findings in these areas are presented below.

Project Staff

Members of the ELM project team were asked about plans in each of the states for the sustained use of the Enhanced Learning Maps and resources following the conclusion of the grant. Staff members' responses to this item are described in this section.

The most prevalent response to inquiries about the sustainability of the ELM software and resources was uncertainty. Many staff members indicated that they are concerned that the work will not be sustained due to a lack of both funding and a clear plan. One staff member noted that "part of the project goal…was to create something that would be sustainable and that educators throughout the nation could use" and went on to say, "We still have great challenges to figure out what exactly we can do and will do."

Several staff described the **necessity of continued support from teachers, school districts administrators, and others to ensure the sustainability of the program**. They said that, even though teachers are excited about the project, recruiting new teachers by word of mouth has not been successful to date and may continue to present problems in the future. One staff member also described their concern with a peer-training model, stating, "I do not think we can expect teachers that know how to use [the software]…to then teach others, although that would be nice." One staff member reported that sustaining the project will also require "somebody that really knows the software well and knows how to make changes and do things…or it is just going to fizzle out." Staff members shared:

I am very afraid of [this project] just dying, because…right now it is word of mouth, and that does not always work. That is the only plan I am aware of, is going to the states, going to the teachers that we have who are supportive of the project in their districts, and encouraging those districts to download the software.

I think based on the responses I have seen from our teachers…there is a lot of interest and excitement on the part of our teachers, and they are going to want to keep using it. That is what you really need. You need a base of people that really are excited by the tool and continue to use it, and that will provide motivation for other people to…keep the necessary ancillary stuff up and running.

[Teachers are] still questioning and [from feedback on] the surveys [they are asking], "What is going to happen after this year? Are we going to have it? I would like to use it, but where is it going to be? How are we going to access it? How can I get new passwords from my [school] district manager?"

There is going to have to be a way to not only continue to get [school district] administrators involved, to get their buy in, but they [also] have to understand what it is and they have to want to use it and we have to find a way to teach what we have been doing in two or three days of training these past years…in order to get [new teachers] up and understanding how to run it.

Two staff members described the process through which ELM project staff are gathering feedback from state partners and teachers to inform plans for sustainability of the project. One staff member noted that Alaska is particularly interested in sustaining the project:

There are plans in place [for sustainability]. But it is one of those areas, especially with our state partners but also with some of our super users, [where we are] reaching out to them and saying, 'How is this working?' One of our plans is that late spring/early summer…[we will be] working with…hopefully at least one state, one district, and one building to take in all the software and [they will] start…scaling it up within their school [or] their district.

Alaska is one that wants to [support the software]…at their state level [so we need to know] … 'How much do you need us to make this happen versus how much can you do it on your own? And if you need us, what else would we have to do so that somebody else could do it on their own?' We have got plans, but I expect them to continually be informed throughout the year.

Some staff members discussed their **hopes for continued funding to sustain the ELM software and resources,** including new grants that would expand on the current project.

There has been some talk about finding a platform like WebHub to put all of the ELM instructional units and nodes and everything out there so that people could use it, but somebody still has to support that and tweak it from time to time, and I would presume someone is going to have to pay for that.

Our technology [team members] are…trying to look at what the best resources out there are for utilization and how we can give the most access to people. Time will tell. Personally, I would like to think there might be money left in the grant to sustain this for a while.

We have written a couple of new grants that would involve some of the current state partners and that would allow them to continue to focus on the maps and continue to use them.

During interviews with project staff, it was apparent that **project staff have many differing viewpoints on how the project will be sustained after the end of the Enhanced Learning Grant**, particularly in terms of where and how the software will be housed. Some staff members indicated that they believed the software would be hosted on a commercial site such as GitHub or WebHub, while others shared that they believed it would continue to be hosted at KU. Finally, some staff members suggested they believed the software would be hosted by individual states, most likely through the state departments of education, or even at the district level.

The next six months most of [the software support] switches over to ATS [Agile Technology Solutions]…a branch of AAI [Achievement and Assessment Institute], our parent department [here at KU]. They are a large department focused on producing software. They are taking over…ELM and they will be hosting and supporting it.

One option would be that we can continue to provide a server option through some group here at KU. But I would anticipate that some schools are going to want to house it on their own. What that would look like would be they would download a package and we would have certain instructions [for them]…We [would] list these four or five things that they have to have in order to run the server. Once they get that server running, then the rest of the code is just straight JavaScript that runs naturally in virtually all browsers.

As far as availability of the software, it is going to be hosted on…GitHub, and our states and/or districts in those states can download it and implement it in those districts [and] schools. As far as publicizing that, and supporting districts or states in that, I do not know what the plan is [for things] like human support. We have a user guide that teachers can use when they access the software, but it is not at the same level as the kind of training that we do. There has not been any talk about providing that kind of support or publicizing it.

We have not yet worked with our individual states to come up with sustainability plans…We are planning two different ways in which states could put in place that level of sustainability. One of them is we are just going to put the whole software package out there…We might be using GitHub, but it depends on a number of things where we host it. It will be out there free to use by any educational entity of non-commercial nature…We will also offer to host those materials for entities that are interested…and willing to pay…[a] small fee that covers the costs associated with [hosting it] and/or costs for continuing to enhance [the software] because technology does not stand still. We will have to figure out what states want.

There was agreement among several of the project staff that **most, if not all, of the software and resources would be open source**, meaning states, districts, schools, and teachers would not have to pay to use them:

> *Part of the deal that was made with [the states] when they signed on to be partners with [this is] that they would get something that they could use in their state. The how and the what have been a little bit vague and it is still a little bit under discussion, because KU would like to retain some proprietary rights to certain parts of it…like back end of the software, but the resources are something that will be open source. They were created with federal grant money, so that is a requirement. The states will have access to that and be able to host it. The states are very interested in having it, but their interest is on a continuum, too [with] Alaska…being the most interested and the most proactive in thinking about, 'How are we going to host this and where are we going to put it? How are we going to continue to train new teachers to be able to use it?'*

> *The grant outlines this project as an open source project. At the end of the grant we will put all of the code in a folder on the internet and anyone who wants to copy it onto their server, so a school district or a state, could open that webpage, download that folder, put it on their server and if we have done our job right as soon as they put that folder on the server, everything loads up and they can start using it immediately. It is that simple, we are designing it so that the deployment process is copy, paste, run. That is the goal.*

> *There has been lots of talk about [how], after the grant [ends], we make all of this open. There has been a lot of talk about how to make that accessible for everyone. I do not know a whole lot about it, but I know that it has been a big focus and continues to be a big focus.*

Several project staff members **expressed concern about the ways in which the project could be replicated in other states,** primarily due to a lack of clear information about plans to sustain the project after the end of the grant. As described by one staff member, developing these plans will be an important part of the work for the upcoming year:

> *Something that I think is important, that we are just getting into this last year, is scaling up...Let us say this [grant-funded] work really ends in 2019, how does the work continue without us? How do we make sure teachers still have these resources, are using them, that people are finding it… useful? If they are finding it useful, can they keep using it, can they keep bringing in more colleagues to continue to use it? How do we make sure that that stands on its own after we disappear if we end up disappearing?*

Two staff members reported that ELM project staff have been working to gather feedback from teachers to understand what support they, and teachers new to the software, will need in the future.

> *We are trying to make it usable. There has been a lot of focus on, 'What kind of supports do they need? What kind of videos do they need? If they did not have us, how would they be able to use this? Is it clear? Do they need more information?' That will continue to be a focus this entire year on*

making sure people can use this successfully, once we are no longer doing that. I think there are definitely plans in place.

There is one school in Alaska and…[one] district here in Kansas that [are]…interested in trying to scale-up to the whole school or district. [We are] getting feedback from them as they are doing it about what is working, what is not working, what other supports do [they]…need from us, to see [if] are there supports we can put in place this final year so they do not need us when the funding ends.

ELM project staff were also asked to describe the ways in which they believe the ELM project could be replicated in other states and what they think would need to happen for other states to successfully use the maps and resources. Multiple staff members suggested **that replicating the project in other states would require that several support systems be in place**, including peer coaching and support, online support, and an easy-to-use, intuitive software interface.

We have done a couple things to try and help facilitate [bringing new teachers on board]…and we have tried to be informative with our current teachers in that this could be a potential role where they could take on some leadership and train other teachers in their building or in their grade level. All of our training materials, like our PowerPoints and handouts…we put on our Enhanced Learning Map website…Anything that you ever wanted to do in the software is in the User's Guide…If you are not necessarily somebody that learns through reading, you can watch [the videos online]…There are definitely some useful tools within the software that can help somebody that does not know what they are doing navigate the software and…it is fairly intuitive.

Ideally, [teachers are] supposed to leave the training, and be trained, and know how to do everything. I feel like we provide that, it is just when they get back to schools and real life, what do they not retain? What do they not remember? What do they not have time to do or practice? Even trained teachers [are]…still going to need someone to go to [for help]…and if there are only 20 teachers in the state, or even 100 in the state, [they might not] know each other or [be able to] collaborate. There needs to be some kind of collaboration tool or communication tool, some kind of procedure or protocol [so] if you have questions, if you are struggling at this level…or if you have even suggestions or improvements for it [here is who you can contact].

[New teachers would] probably need a guide…or a coach, which could be a colleague. We have produced a lot of printed resources, including a User's Guide, and the video resources, and our webinars are all archived. A resourceful teacher could use those…but the best way to bring new people along…is [through] people showing the resources to a colleague and…making the software flexible enough that teachers are able to make their own maps [so]…they can make maps for individual students.

What I have gathered from teacher feedback is that the maps are overwhelming. It really does… need a human touch. Somebody needs to sit with teachers and explain to them how these are beneficial, because I do not think it is [easy to see]…when you just go, and log in, and create

account…Which is why I believe the intent is for…teachers who are supportive of the project and see its value…[to] bring it into their districts, and then…train teachers in their districts to use it.

The hope is that the professional development on how to use the system, and the system itself being developed to be intuitive as possible…will make it fairly easy for teachers who have not been involved. It will be easier…for teachers in the same schools to start using it, because they will have someone they can bounce ideas off of or they can get some support from.

I think that is a question we have kept in our minds throughout the entire project and that is why we have as much technical documentation and all the teacher videos…is [because we] recognize teachers have different learning styles. [We have been] making sure that there is always a place they can go look for information, where they do not have to reach out to us. That was also the other rationale for going ahead and putting in [a] communication [tool]…within the learning map software itself, so that teachers could turn to other teachers to help them.

In order [for teachers] to use it successfully there is really nothing [that needs] to be added…Once it is hosted by a server anyone…who the district gives permission to…can use it. We have provided ample instruction via video tutorials and written documentation. I do not think anything else needs to happen [for the software to be usable].

Two staff members described the **necessity for continuous improvements to the software and content once the grant ends**, noting that the ELM project staff need to figure out "not just how it works, but then how to make it better. The stuff that is in there now is not going to be perfect, or relevant, or great in five years." Another staff member concurred, suggesting, "As far as adding content or providing one-on-one assistance…there needs to be a mechanism in place whereby we can employ people to do that."

One staff member summed up the challenges faced in replicating the project in other states, including training new teachers to use the software and planning the ways in which states and/or school districts could "install and maintain" the software:

One of the most important things would be finding a way to replicate the training so that new teachers can be brought on board with using the software, and another key aspect would be to determine a package for the software so that either states, or school districts, could install and maintain it on their own.

State Partners

State partners were asked about plans in their state for the sustained use of the Enhanced Learning Maps and resources following the conclusion of the Enhanced Assessment Grant. State partners' responses to this item are described in this section.

Two state partners **indicated that transferring the software from KU servers to state servers is of primary importance.** One state partner shared, "For this year, we want to get it on

our server so that everybody has it and it is available" while another reported, "We are working with our IT team right now and…there is a little disconnect right now, trying to connect [our IT team] with the IT team that is working with Enhanced Learning Map. [We are trying]…to make sure that we can transfer the software to our server so that we can have it within the state."

However, one state partner expressed uncertainty about the process of transitioning the software from KU to the states:

> *[How would states] have access to materials and…how would it continue to improve? That is a question I have and I know they are working on sustainability with the hosting, but I am just not sure…I had been kind of planting some seeds around here [at the state level], but then when we had the…the last training…[and the ELM project staff] talked about…trying to figure out ways that the districts could host it themselves. I am throwing that back to KU, because I do not know what their plans are now for hosting.*

State partners in two states discussed plans for sustaining and expanding the use of the Enhanced Learning Maps. One state education agency representative indicated that his/her state plans to include the ELM software in all of their teacher professional development opportunities, while another described how local education agencies can serve as a link between the state department of education and teachers and provide training on the ELM software.

> *We have, in our state plan, [a section]…about building up teacher preparation as far as the [state] standards. The Enhanced Learning Map is going to be part of all the professional development that we have moving forward regarding standards…Ideally, all of our education leaders would be well versed in this so that they could help the new teachers that come in. Or that [the ELM software]…can be part of an academy in the summer that helps teachers get ready for the next year. Those types of things are where we would like to go…[We will also] do the outreach awareness piece [where]…every time we talk about [state] standards we talk about [the ELM software].*

> *The teachers there actually were all coming to me, and saying, 'We are so excited, we want to do a lot of stuff with this.' It was really kind of exciting. However, at the department, that probably would not be where we would have the best way to do it. It would be at our CESAs [Cooperative Educational Services Agencies]…A lot of…[our] districts are small, so the CESAs provide professional learning and provide opportunities for teachers…That would be the place where the trainings would happen. It is very grassroots, teachers all over knew who their CESA person was, and we contacted them. But again, this is going to be a…heavy lift on this end. All the CESAs operate differently, so we would have to figure out how to best tap into that network. I told the teachers, 'You actually probably are the best advocate for this, if you go right to the CESAs, and you say, "I want to make this happen."*

One state partner indicated that the "data sharing" aspect of the software "is going to be the most…[challenging]…so that is something we would have to handle at the state." This state partner went on to say, "There is a lot of excitement, but I have a feeling there might be a lot of challenges to make it scale up."

State partners were also asked to describe the ways in which they believe the ELM project could be replicated in other states and what they think would need to happen for other states to successfully use the maps and resources. Two state partners suggested that **the ELM project staff would "need to have a team that provides training**…like how they do it now, 'Here is the training, this is how you use it.' I think they need to continue with that" for teachers in other states to successfully use the maps and resources. Another state partner agreed, suggesting, "They are going to have to recruit their teachers and have some trainings like we have done and then they are going to have to figure out the hosting."

In addition, individual state partners provided the following feedback:

- State 1: This state partner expressed concern over the likelihood that states would be able to carry the project forward on their own, especially considering the small number of people who may be involved in each state. This partner explained that KU needs to have a team to "be the ambassadors…Ideally…we [at the state level] would be able to carry it forward [but in my state] I know about it, and another person here knows about it, but if we leave, nobody knows about it."

- State 2: The state partner offered guidance on recruiting additional states and establishing clear lines of communication with teachers in those states:

  I keep going back to this communication thing. I think it is making sure that you have a really clear path to how you are going to communicate with teachers, which I think in many states is kind of a problem for a lot of different reasons. Understanding the culture…of communication in the state would be one thing that would be helpful. It is communication and messaging, [and states will need] to really dig into that early on in the project.

Conclusions and Recommendations

This evaluation report focuses on Year 3 of the *Enhanced Learning Maps* project. The following are the conclusions and recommendations drawn from a comprehensive review of the findings.

Conclusions

Conclusions are organized around six areas, which align to the primary areas evaluated. Those areas include recruitment; implementation; impact on instructional practice; state-level trainings; communication and collaboration; and sustainability, scale-up, and replication.

Recruitment

- State partners and project staff agreed that recruiting teacher participants has been a primary challenge, in part because of the "word of mouth" recruiting strategy, multiple initiatives occurring for one state which required demands on teachers' time, and changes in personnel in some states.
- Project staff suggested that creating and maintaining clear lines of communication with state partners would help future projects with recruitment efforts. They also recognized the vital work done by state partners in reaching the targeted number of participants.

Implementation

- Project staff who were familiar with the original proposal agreed that the project is being implemented as planned and, in some cases, better than anticipated. State partners also agreed that implementation had gone as expected in their states.
- The majority of teachers reported implementing two or three units. ELA teachers were more likely than math teachers to report teaching six or more units. The most common reason for not implementing more units were time constraints, alignment to district-adopted curriculum, and lack of content.
- Of the resources that were included in the units, teachers reported using the Student Activity, Instructional Activity Handout, and Instructional Activity most often. Least often used was the Student Locater Tool.

Impact on Instructional Practice

- The ELM project impacted Cohort 1 and 2 teachers' instructional practices by assisting them in introducing new concepts, providing instruction in specific topic areas, and aiding lesson planning. Teachers also used the ELM materials and learning maps to shift from teacher-directed to student-directed learning, in which they asked more questions, listened more closely, questioned students' reasoning, and let students guide their own learning.

- Cohort 1 and 2 participants used the ELM materials and learning maps to adjust their instructional practice to identify students' misconceptions, help students reach learning targets, address gaps in students' understanding, and identify where their students are in their learning and what they should learn next.
- The summer training presentations increased teachers' knowledge of tools they can use for formative assessment, including listening to and questioning students more frequently during instruction, and increased their capacity to assess students' learning and determine next steps.

State-Level Trainings

- Cohort 3 and returning Cohorts 1 and 2 participants rated the presenter quality, materials, and content of the summer 2018 state-level trainings very highly. They also said that the objectives were clear; the training provided information and resources that can be accessed for future use; and the information was of high quality, relevance, and usefulness.
- Training participants found the process of going over the maps and the maps themselves, as well as the units and accompanying resources, to be the most helpful aspects of the summer trainings. They also appreciated the responsiveness and helpfulness of the ELM presenters and staff.
- Most participants reported that they would like to use the ELM software frequently and that the functions of the software are well integrated. Furthermore, only a small percentage of participants indicated that they thought they would need technical support to use the software.

Communication and Collaboration

- Project staff reported that they communicate and collaborate with each other in a variety of ways, including biweekly and weekly meetings, email, and online or face-to-face conversations. Some staff reported inconsistencies in the quality of this communication, in particular between members of the leadership team and the research/content and technology teams.
- Project staff indicated that there was room for improvement in communication and collaboration with state partners. Conversely, state partners were universally pleased with their collaboration and communication with the ELM project staff. They suggested that an added focus on timeliness could only enhance this collaboration.
- Project staff were divided in their perceptions of the degree to which input from state partners and Governance Board members is taken into consideration. Some staff indicated that suggestions from state partners are weighed too heavily, while others suggested that they did not affect the project and were appropriate to incorporate.

Sustainability, Scale-up and Replication

- ELM project staff and the states have begun discussions about the sustainability of the ELM project following the cessation of the Enhanced Assessment Grant funding. The resources will be available as open source, though it has not yet been determined how or where the software will be hosted (i.e., individual states' or districts' servers, KU, or a commercial site).
- Concerns were shared by both ELM project staff and state partners about the support and training needed to sustain and scale-up the use of the maps and resources following Year 4, and that support systems and plans for updating project materials are critical for successful continued use.

Recommendations

Based on the findings and conclusions, the following recommendations are provided for ELM project staff to consider in the project's final year of implementation. Recommendations are organized by four areas: recruitment; implementation; communication and collaboration; and sustainability, scale-up and replication.

Recruitment

- Although recruitment will not be a part of the final year of the project, there are some lessons learned that can be applied to any similar future projects, i.e., clearly communicate at the onset partner expectations with regard to participant recruitment and give appropriate and timely attention to recruitment at partner meetings (several months in advance of when recruitment needs to occur).
- Likewise, where there are changes in state partner representation, consider having individual meetings with the new state contact to discuss project expectations and respond to any questions.

Implementation

- Continue to be adhere to what was proposed in the grant application. At this point, the ELM project has been implemented as proposed and to some extent has gone beyond its original scope in order to better meet state and teacher needs. Although this is a positive, it should be balanced to ensure that any additional activities can be completed within the allocated budget without interfering with the effort and resources that were originally allocated to accomplish the proposed scope of work.
- Continue to provide support to the teachers as they use the maps and implement the units. The ongoing modes of support, although not necessarily optimally utilized, are valued by the teachers who have requested assistance.

Communication and Collaboration

- To ascertain the impact on instructional practice and student learning (the focus of the Year 4 research) it is critical that teachers are implementing the units, using the map, and reporting on its usage. Consider developing a communication plan (i.e., strategies, timeline, methods) for monitoring teacher involvement and usage data collection.
- Consider how partners can be involved in Year 4 to promote full participation for Cohorts 1-3. Without ongoing communication and encouragement, it is less likely teachers will follow through with project expectations.
- Similar to the implementation recommendations, ensure regular communication with teachers and continue to provide support to aid in continued engagement in the ELM project.

Sustainability, Scale-Up and Replication

- Continue to work directly with state partners and school districts to gather feedback on the best way to sustain and scale up the ELM project in each state, including developing plans for the transfer of the software to the appropriate server(s).
- Facilitate a discussion or series of discussions with state partners and/or Cohort 1 and 2 teachers on the successes and challenges they faced in implementing the ELM project. Utilize this information to develop a document detailing how the Enhanced Learning Maps and resources could be used by other districts, schools, and teachers.

Appendix A: 2018 Training Survey

Enhanced Learning Maps (ELM) Project
Training Evaluation Form

With PENCIL or BLUE or BLACK INK, please fill in the circle for the choice that most closely represents the extent to which you agree or disagree with the following statements. Like this: ● Not like this: ⊗ or ⊘

Cohort Group Participation: ☐ Summer 2016 ☐ Summer 2017 ◂ Summer 2018 (first year attended training)

ELM Content Area Participation (select all that apply): ☐ English language arts ☐ Mathematics

Role: ☐ Teacher ☐ Administrator ◂ Other (describe) _____

Part I: Evaluation of Training

	N/A	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Facilitator Quality						
The presenters were knowledgeable about the subject matter.	☐	☐	☐	◂	▸	▲
The presenters were responsive to questions or concerns.	☐	☐	☐	◂	▸	▲
The presenters had good presentation skills.	☐	☐	☐	◂	▸	▲
The presenters included a variety of learning activities.	☐	☐	☐	◂	▸	▲
Materials						
Materials were culturally responsive.	☐	☐	☐	◂	▸	▲
Materials included diverse viewpoints.	☐	☐	☐	◂	▸	▲
The topics and materials are relevant to mathematics and/or English language arts educators.	☐	☐	☐	◂	▸	▲
Materials were research-based.	☐	☐	☐	◂	▸	▲
Practical and Environmental Issues						
Materials (including visual aids) supported the training goals.	☐	☐	☐	◂	▸	▲
Pace of the training sessions was adequate.	☐	☐	☐	◂	▸	▲
Length of the training was adequate.	☐	☐	☐	◂	▸	▲
Seating was adequate and arranged appropriately for the activities.	☐	☐	☐	◂	▸	▲
Room temperatures were comfortable.	☐	☐	☐	◂	▸	▲
The meeting location was accessible.	☐	☐	☐	◂	▸	▲
Objectives						
Objectives for the training were clear.	☐	☐	☐	◂	▸	▲

	N/A	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The objectives were accomplished.	☐	☐	☐	☐	☐	☐
Content						
The training covered the range of topics I expected it to cover.	☐	☐	☐	☐	☐	☐
The training addressed the topics in sufficient detail.	☐	☐	☐	☐	☐	☐
The information presented was comprehensive.	☐	☐	☐	☐	☐	☐
The topics covered in the training were relevant to the ELM project goals.	☐	☐	☐	☐	☐	☐
The training encouraged collaboration with peers.	☐	☐	☐	☐	☐	☐
The training created a sense of community amongst participating teachers.	☐	☐	☐	☐	☐	☐
Prior to attending this training, I was already knowledgeable about the academic content taught to children that is modeled in the map.	☐	☐	☐	☐	☐	☐
Outcomes						
The training provided me with information resources that I can access for future use.	☐	☐	☐	☐	☐	☐
The training **increased my knowledge of how to use the learning map resources**.	☐	☐	☐	☐	☐	☐
The knowledge I gained from examining the learning map resources **can be incorporated into my teaching**.	☐	☐	☐	☐	☐	☐
I **will incorporate** the use of learning map resources into my teaching.	☐	☐	☐	☐	☐	☐
The training **increased my knowledge in the use of learning map resources for formative assessment**.	☐	☐	☐	☐	☐	☐
The knowledge that I gained on use of learning map resources for formative assessment **can be incorporated into my teaching**.	☐	☐	☐	☐	☐	☐
I **will incorporate** the use of learning map resources for formative assessment into my teaching.	☐	☐	☐	☐	☐	☐
I **understand the expectations** for participating in the research aspect of the ELM project.	☐	☐	☐	☐	☐	☐
The training met my expectations.	☐	☐	☐	☐	☐	☐
Quality, Relevance, and Utility						
Overall, the information presented was of **high quality** (i.e., grounded in research and best practice, and designed to meet adult learners' needs).	☐	☐	☐	☐	☐	☐
Overall, the information provided was **useful** (i.e., applicable to my teaching responsibilities).	☐	☐	☐	☐	☐	☐
Overall, the information and activities were **relevant** (i.e., timely, and worth the time and effort)?	☐	☐	☐	☐	☐	☐

Part II: Evaluation of Enhanced Learning Maps (ELM) System

	N/A	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
System Components						
I think that I would like to use this ELM software frequently.	_	☐	☐	◄	►	▲
I found the ELM software unnecessarily complex.	_	☐	☐	◄	►	▲
I thought the ELM software was easy to use.	_	☐	☐	◄	►	▲
I think I would need the support of a technical person to be able to use the ELM software.	_	☐	☐	◄	►	▲
I found the various functions in the ELM software to be well integrated.	_	☐	☐	◄	►	▲
I thought there was too much inconsistency in the ELM software.	_	☐	☐	◄	►	▲
I would imagine that most people would learn to use the ELM software very quickly.	_	☐	☐	◄	►	▲
I found the ELM software very cumbersome to use.	_	☐	☐	◄	►	▲
I felt very confident using the ELM software.	_	☐	☐	◄	►	▲
I needed to learn a lot of things before I could get going with the ELM system.	_	☐	☐	◄	►	▲

Please use the following space to offer additional comments about the training.

Most helpful aspect:	**Least helpful aspect:**
I learned:	**Appreciations/Concerns/Suggestions:**

Thank you for your feedback!

Appendix B: Cohort 1 and 2 Implementation and Impact Survey

Enhanced Learning Maps - Implementation and Impact
Teacher Survey - Spring 2018

Purpose of the Survey: As a participant of the Enhanced Learning Maps (ELM) project, we are requesting your completion of this survey. The survey includes questions about your implementation of the ELM units, organizational and administrator support, use of the Enhanced Learning Maps and impact on instructional practice, formative assessment and personalized learning, and content-focused instructional practices. It also includes questions on your overall perceptions of the project. This survey will take you about 15 minutes to complete.

Protecting Your Rights and Your Privacy: This evaluation poses minimal risks and your responses to this survey are confidential. Data will be reported to ELM project staff at the aggregate level, not at the individual level. Names will not be used in any study reports. Identifying information will be removed and results will be summarized in evaluation reports to protect the confidentiality of the participants wherever possible.[1] Your participation in completing this survey is voluntary. You may choose to not answer any particular question or stop completing the survey at any time.

Benefits: There are no direct benefits or compensation to individuals for participating. However, because our evaluation report will provide crucial information to ELM project staff, they will be able to gain an understanding of the project's implementation and impact on participants. Additionally, the evaluation can contribute to the larger collection of research literature about the impact of the Enhanced Learning Map resources on teacher practice and student learning.

Questions: We appreciate your time in participating in the evaluation. If you have any questions about this survey, please feel free to contact Kimberly Good, the evaluation manager (303.632.5546). For information on protection of your rights as a participant, you may contact Sheila Arens (303.632.5625; sarens@mcrel.org), Chair of McREL's Institutional Review Board.

[1] Please note that Institutional Review Boards do have the authority to inspect consent records and data files only to ensure compliance with approved procedure. If, during the process of collecting data, a threat of violence against an individual or entity is uncovered, McREL cannot guarantee anonymity or confidentiality to any party involved.

Electronic Consent
If you agree to participate in this survey, please click "Yes, I agree to participate in the survey" below. By doing so, you are indicating that you have read the information on this page and that you voluntarily agree to participate in the survey.

If you decline to participate in the survey, click "No, I do not agree to participate in the survey" below.

- (•) Yes, I agree to participate in the survey.
- ( ) No, I do not agree to participate in the survey.

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Next

Background Information

What grade level(s) do you currently teach? (Please select all that apply.)

- ☐ Grade 2
- ☐ Grade 3
- ☐ Grade 4
- ☐ Grade 5
- ☐ Grade 6
- ☐ Grade 7
- ☐ Grade 8
- ☐ Other (please specify):

To which ELM content area are you assigned?

- ◉ English language arts
- ○ Mathematics

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ELM Unit Implementation

How many ELM units did you *fully* implement this school year?

- ◉ None
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5
- ○ 6
- ○ More than 6

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To help ELM project staff better understand implementation of the ELM units, please describe why you were unable to implement any of the units.

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ELM Unit Implementation

How many ELM units did you *fully* implement this school year?

- ○ None
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5
- ○ 6
- ◉ More than 6

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To help ELM project staff better understand implementation of the ELM units, please describe why you were unable to implement more of the ELM units.

To what extent did you use each of the following ELM materials in the units you taught?

	Not at all	To a slight extent	To a moderate extent	To a great extent
Enhanced Learning Map Document	○	○	○	○
Teacher Notes (a synopsis of relevant research with links to other materials in the unit)	○	○	○	○
Teacher Notes video	○	○	○	○
Instructional Activity	○	○	○	○
Student Activity	○	○	○	○
Student Activity in Solution Guide	○	○	○	○
Instructional Activity Handout	○	○	○	○
Instructional Activity Supplement	○	○	○	○
Student Locater Tool	○	○	○	○

Did you complete a feedback survey for ***every ELM unit*** you taught and ***all*** materials you used?

- ○ Yes
- ○ No

If you experienced any challenges implementing the ELM materials, what were they?

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Organizational and Administrator Support

My principal is aware of my involvement in the ELM project.

- (•) Yes
- ( ) No

My principal has…

	Strongly Disagree	Disagree	Agree	Strongly Agree
supported my involvement in the ELM project.	( )	( )	( )	( )
provided me with opportunities to share with my colleagues information about the ELM project.	( )	( )	( )	( )

I received the information/guidance I needed from...

	Strongly Disagree	Disagree	Agree	Strongly Agree
my *state or district contact* to support my implementation of the ELM units and use of the learning maps.	( )	( )	( )	( )
ELM project staff to support my implementation of the ELM units and use of the learning maps.	( )	( )	( )	( )

What additional information/guidance would you have liked to support your implementation the ELM units and use of the learning maps?

Overall, how satisfied are you with your state department of education's efforts to engage you in the project?

- ( ) Strongly Dissatisfied
- ( ) Dissatisfied
- ( ) Satisfied
- ( ) Strongly Satisfied

Would you like to comment on your response to satisfaction with your state department of education engaging you in the project?

Overall, how satisfied are you with the ELM project staff's efforts to engage you in the project?

- Strongly dissatisfied
- Dissatisfied
- Satisfied
- Strongly satisfied

Would you like to comment on your response to satisfaction with ELM project staff's engaging you in the project?

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ELM Project Experiences

Rate the usefulness of resources and supports provided through the ELM project to aid you in implementing effective formative assessment practices and personalized learning experiences for your students.

	Not useful	Somewhat Useful	Useful	Very Useful	Not Applicable
Learning maps	○	○	○	○	○
ELM units	○	○	○	○	○
Summer training	○	○	○	○	○
Real time ELM project staff support (e.g., phone, e-mail, video)	○	○	○	○	○
Archived support webinars	○	○	○	○	○
ELM support chats	○	○	○	○	○
Newsletters	○	○	○	○	○
ELM website	○	○	○	○	○

What were your experiences with the ELM software?

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Not Applicable
I thought the ELM software was easy to use.	○	○	○	○	○	○
I needed the support of a technical person to be able to use the ELM software.	○	○	○	○	○	○
I found the various functions in the ELM software to be well integrated.	○	○	○	○	○	○
I learned to use the ELM software very quickly.	○	○	○	○	○	○
I found the ELM software very cumbersome to use.	○	○	○	○	○	○
I thought there was too much inconsistency in the ELM software.	○	○	○	○	○	○
I felt very confident using the ELM software.	○	○	○	○	○	○
I needed to learn a lot of things before I could get going with the ELM software.	○	○	○	○	○	○
I found the ELM software unnecessarily complex.	○	○	○	○	○	○
I will continue to use the ELM software following my participation in the project.	○	○	○	○	○	○

Have you shared the ELM units or learning maps with your colleagues?

- ◉ Yes
- ○ No

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In what type of setting have you shared the ELM units and/or learning maps? (Select all that apply.)

- [ ] Community of practice
- [ ] Curriculum meeting
- [ ] Grade level or team meeting
- [ ] One on one with a colleague
- [ ] Other (please describe):

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ELM Project Experiences

Rate the usefulness of resources and supports provided through the ELM project to aid you in implementing effective formative assessment practices and personalized learning experiences for your students.

	Not useful	Somewhat Useful	Useful	Very Useful	Not Applicable
Learning maps	○	○	○	○	○
ELM units	○	○	○	○	○
Summer training	○	○	○	○	○
Real time ELM project staff support (e.g., phone, e-mail, video)	○	○	○	○	○
Archived support webinars	○	○	○	○	○
ELM support chats	○	○	○	○	○
Newsletters	○	○	○	○	○
ELM website	○	○	○	○	○

What were your experiences with the ELM software?

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Not Applicable
I thought the ELM software was easy to use.	○	○	○	○	○	○
I needed the support of a technical person to be able to use the ELM software.	○	○	○	○	○	○
I found the various functions in the ELM software to be well integrated.	○	○	○	○	○	○
I learned to use the ELM software very quickly.	○	○	○	○	○	○
I found the ELM software very cumbersome to use.	○	○	○	○	○	○
I thought there was too much inconsistency in the ELM software.	○	○	○	○	○	○
I felt very confident using the ELM software.	○	○	○	○	○	○
I needed to learn a lot of things before I could get going with the ELM software.	○	○	○	○	○	○
I found the ELM software unnecessarily complex.	○	○	○	○	○	○
I will continue to use the ELM software following my participation in the project.	○	○	○	○	○	○

Have you shared the ELM units or learning maps with your colleagues?

- ○ Yes
- ◉ No

0% 100%

How likely are you to share the ELM units or learning maps with your colleagues?

- ○ Not likely
- ○ Somewhat likely
- ○ Likely
- ○ Very likely
- ○ Not applicable

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Use of Enhanced Learning Maps and Impact on Instructional Practice

For what purposes did you access the learning maps? (Select all that apply.)

- ☐ Did not access beyond the ELM training
- ☑ Planning for and teaching the ELM units
- ☑ Planning for and teaching state standards beyond those addressed in the ELM units
- ☑ Other (please describe):

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Using the Enhanced Learning Maps has helped me to…

	Not at all	To a slight extent	To a moderate extent	To a great extent
identify where my students are in their current understandings of a concept or topic.	○	○	○	○
address gaps in students' understandings.	○	○	○	○
identify students' misconceptions.	○	○	○	○
help students reach their learning targets.	○	○	○	○
work with struggling learners.	○	○	○	○
provide differentiated instruction to my students.	○	○	○	○
personalize learning that was appropriate for students at different points in the learning pathways.	○	○	○	○
communicate students' progress to parents.	○	○	○	○
identify where my students are at in their learning and what they should learn next.	○	○	○	○
provide my students task-specific feedback that helps them fill in gaps in their knowledge.	○	○	○	○
adjust my instructional practice to keep my students moving towards their learning goals.	○	○	○	○
provide an alternative explanation or example when students are confused.	○	○	○	○

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As a result of using the Enhanced Learning Maps...

	Not at all	To a slight extent	To a moderate extent	To a great extent
my understanding (or knowledge) of how students think has changed.	○	○	○	○
my ability to make decisions about individual students' needs has changed.	○	○	○	○
I have more data available to me to provide personalized instruction for my students.	○	○	○	○
my use of questioning strategies to elicit evidence of student thinking has changed.	○	○	○	○

How have you used the Enhanced Learning Maps in your instruction this year?
Please provide two or three specific examples.

What changes in student learning have you observed, if any, as a result of using the Enhanced Learning Maps?
Please provide two or three specific examples.

Reflecting on your instructional practice before your participation in the ELM project and now, respond to the following question.

I used to . . . But now I . . .

(The following examples are provided to aid you in thinking about how you might respond: I used to do a lot of explaining, but now I do a lot of questioning. I used to do a lot of talking, but now I do a lot of listening. I used to think about teaching the curriculum, but now I think about . . .)

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Use of Enhanced Learning Maps and Impact on Instructional Practice

For what purposes did you access the learning maps? (Select all that apply.)

- [x] Did not access beyond the ELM training
- [ ] Planning for and teaching the ELM units
- [ ] Planning for and teaching state standards beyond those addressed in the ELM units
- [ ] Other (please describe):

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Reflecting on your instructional practice before your participation in the ELM project and now, respond to the following question.

I used to . . . But now I . . .

(The following examples are provided to aid you in thinking about how you might respond: I used to do a lot of explaining, but now I do a lot of questioning. I used to do a lot of talking, but now I do a lot of listening. I used to think about teaching the curriculum, but now I think about . . .)

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Formative Assessment and Personalized Learning

How has your understanding of formative assessment changed?

How has your ability to provide personalized instruction changed?

0% 100%

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Background Information

What grade level(s) do you currently teach? (Please select all that apply.)

- ☐ Grade 2
- ☐ Grade 3
- ☐ Grade 4
- ☐ Grade 5
- ☐ Grade 6
- ☐ Grade 7
- ☐ Grade 8
- ☐ Other (please specify):

To which ELM content area are you assigned?

- ○ English language arts
- ◉ Mathematics

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Please indicate your skill level and confidence level in the following areas of mathematics instruction.

	Skill Level				Confidence Level			
	Not skilled	Slightly skilled	Moderately skilled	Highly skilled	Not confident	Slightly confident	Moderately confident	Highly confident
Analyzing errors made by students in mathematics tasks	○	○	○	○	○	○	○	○
Facilitating mathematical discourse	○	○	○	○	○	○	○	○
Giving and evaluating explanations	○	○	○	○	○	○	○	○
Appraising unexpected claims, solutions, and methods	○	○	○	○	○	○	○	○
Choosing and using representations	○	○	○	○	○	○	○	○
Examining correspondences among representations and solutions	○	○	○	○	○	○	○	○
Choosing and using definitions	○	○	○	○	○	○	○	○
Interpreting and responding to students' ideas	○	○	○	○	○	○	○	○

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We thank you for your time spent taking this survey.
Your response has been recorded.

Survey Powered By Qualtrics

Appendix C: Cohort 1 and 2 Survey Open-ended Responses

Cohort 1 and 2 participants were invited to respond to an online survey in spring 2018. Responses to each of the open-ended questions, organized by theme, are presented in full in Table C1-C11 Respondents often provided comments that fit into more than one category.

Table C1. Why unable to implement any units (*n* = 7, *n* ELA = 3, *n* Math = 4)[9]

Theme	Comments
Time Constraint (*n* = 3)	• I was unable to implement units this year due to time restraints and I did not get enough time to look them over and prepare for teaching the units. (ELA) • Couldn't find time to work with it and adapt it to my individual students. (ELA) • I changed grade levels this year to kindergarten and first. I just was not able to make it work for these grade levels. However, next year I will be teaching 2, 3, and 4 and should be able to make it work. Thank you. (ELA)
Not aligned with district-adopted curriculum (*n* = 3)	• It did not coordinate well with our curriculum requirements and was too complicated to select only parts for use. (Math) • My class is an RTI [Response to Intervention] class and has a prescribed curriculum. (Math) • I implemented parts of units. However, with the new math curriculum within my district this year I was unable to manage that learning curve with full ELM implementation. (Math)
Too cumbersome (*n* = 1)	• This project was too cumbersome and as our district office director said, "This program is way too complicated for our teachers, staff, and students." My suggestion is to get with real teachers and not computer people and revamp the whole program. (Math)

[9]Respondents who indicated they didn't implement any units were asked to describe why there were unable to implement.

Table C2. Why unable to implement more units (*n* = 36, *n* ELA = 12, *n* Math = 24)[10]

Theme	Comments
Time (*n* = 16)	• Didn't have time; had to stick to pacing guide, (ELA) • I had difficulty planning lessons due to extra time devoted to other classes integrating more criteria. (ELA) • I have yet to enter any information. I have emailed the ELM Staff and asked when or if the sessions that were done as chats would be available online. So, I have yet to enter my comments on the unit. I needed some help to maneuver this portion of the system. I will have more time when school is out. (ELA) • Time and incorporation (ELA) • Fidelity to our curriculum and interventions, time, (Math) • I had a busy schedule and just didn't make time to read through everything to do them. It is my first year and I wanted to implement with fidelity, so I thought fewer was better. (Math) • I was unable to implement more of the ELM units because of lack of time. I'm crunched for time as it is. I'm proud of myself for getting the three ELM units in. I would have liked to have used more but I just couldn't find the time to. (Math) • It took me a while to figure out which units to use. They are very comprehensive and they require a lot of preparation time. I had two Alaska courses to complete at the same time. I hope to be able to do more next year. (Math) • In addition, because it was my first year with the units, it took more time for me to familiarize myself with them. I believe I will be able to successfully implement more units in a timely and efficient manner as I become more familiar with their format. (Math) • The amount of time committed to teaching the district curriculum was the main reason I was not able to complete the units provided by ELM. (Math) • The first year I fully implemented six full units. I still did those six this year, not necessarily as fully as last year. Because it is my second year it was more difficult to find more time to do more lessons. I did a full lesson in class and then used other units for intervention work. (Math) • Time constraints. (Math) • Time constraints. (Math) • Time. In my position, I have limited time with my students so the units took much longer to complete. (Math) • Time. I am new to the project this year and I was learning the whole process. Reading the research and the lesson takes time. (Math)

[10] Some respondents gave multiple answers, therefore, the total number responding to the question may not equal the number of bullet points. Respondents who indicated they implemented fewer than six units were asked to describe why there were unable to implement more of the units.

Theme	Comments
	• We had a time problem where we were running out of time before the state assessments to get the others going. I did choose to present and use a unit after the assessments. (Math)
District-adopted curriculum alignment (*n* = 9)	• It was difficult to match the content of the lessons with my current curriculum. (ELA) • We have a set curriculum so the units must be done in the cracks. (ELA) • Demands of assigned curriculum/keeping up with the curriculum pacing rubicon. (Math) • I was able to fully implement four math and two ELA units this year. I implemented all but lesson 4 of the scaled graphs unit and this was due to time constraints. The geometry math unit was not fully implemented because it was not a separate unit in my school's curriculum. Our curriculum integrates these concepts with our fraction unit, so I was focused on ELM's Fractions as Numbers unit during this time frame. After looking at the geometry unit, I realized I had already taught most of the concepts within the fraction unit. Knowing this, I should be able to use it along with the Fractions as Numbers unit and Eureka's fraction unit next year. (Math) • Since I am required to teach out of a standard curriculum, I had to cover missed skills, which provided a double-edged sword in the time. I have below grade level students, and all materials either from ELM or the district are at grade level. (Math) • We have a curriculum in our district that we are supposed to teach. With the one unit I did do, I just chose one of my classes to teach it to and used our regular curriculum for my other classes. (Math) • We switched curriculum, bringing in a brand-new series, Carnegie Learning. In addition, I became more involved with other assignments from all core subjects. (Math) • We implemented new instructional materials this year and could not add any fillers per district mandate. (Math) • Fidelity to our curriculum and interventions, time, (Math)
Content availability (*n* = 6)	• At the beginning of the year there were not many fifth grade ELA units that I could use. I was able to use either pieces or full units that would total seven. I had to use about two units that were a grade lower than fifth. (ELA) • I didn't find one that met the criteria that I was teaching. (Math) • There were only three or four units for second grade and some of them were only posted near the end of the school year so I ran out of time to implement any more. I also implemented a few of the language arts units for second grade. (Math) • Also, there wasn't a unit available for every topic/skill I was teaching. (Math) • I would have implemented more if more units had had resources. (Math) • Lack of content availability to meet needs of students each trimester. (Math) • I would have implemented more if more units had had resources. (Math)

Theme	Comments
Non-classroom teacher: Coach, Title I teacher (*n* = 4)	• As a district instructional coach for Tier 2 and 3, I need to partner with a classroom teacher to try out the units. (ELA) • As an instructional coach, I was interested in the units as resources for our curriculum map and to fill holes of missing lessons. We are also choosing priority standards this year as well as deconstructing those standards. The units helped provide background for our work. I did collaborate with one teacher to fully implement one of the units for reference. (ELA) • I am a Title I teacher so I have to work my lessons around the time that I am in the classrooms as well as around what the teachers are doing in their curriculum. (ELA) • I am not a classroom teacher, which makes it tough for me to schedule times with teachers to go in and teach units/lessons to their class. (Math)
Student challenges: lower skill levels, behavior (*n* = 3)	• Also, the routine within the Glencoe Course 2 curriculum offered high structure something I needed for a rather rowdy math class, while teaching seventh grade for my first time. Next year I will be in elementary again, where I am much more familiar. (Math) • My students are very low and the units were above their level in understanding and ability, (ELA) • The second reason was the fact that my students' skill level is about a year below grade level. I had to spend some time re-teaching skills that were missed from previous grades. (Math)
Standards alignment issue (*n* = 2)	• I only used the ones when I felt necessary and when they fit into the quarter based on the standard(s). (ELA) • When I went to training, there weren't resources listed for more than a couple standards, so I vested my time and energy in the two that made the most sense to me with the most research and resources. (Math)
Changes in school/ department (*n* = 1)	• This school year ended up being the most challenging of my 15 years of teaching for a few reasons that had nothing to do with ELM. Some building/math department procedures were changed and I had a challenging group of students. I think this was the reason that I did not fully implement all the ELM units. I hope to implement more next school year. (Math)

Table C3. Challenges with implementation (*n* = 26, *n* ELA = 9, *n* Math = 17)[11]

Theme	Comments
Time (*n* = 9)	• It was difficult to find time to fully implement them and complete the survey. However, that could be said for any resource I use. I make it may own. (Math) • None other than time. (ELA) • Time. (ELA) • Finding the time to do the units (ELA) • Time. They are very lengthy. (Math) • Time constraints (Math) • I still need to do the survey for the second one. I just have not had the extra time with the craziness of middle school and job demands, but now that the kids are away I can go back and do that second survey. Sorry! (Math) • The unit tests were very long and took students a long time to finish. Ended up not have students complete them in their entirety. (Math) • I was overloaded this year for my student schedule and unfortunately did not manage my time well. I will make an effort to complete some of the feedback surveys in the next week. (Math)
Technical (*n* = 7)	• I know in the beginning it was confusing because there are two different login places. (ELA) • The maps are not user friendly to navigate and view. (ELA) • The locater tool! it was very bothersome. (ELA) • Trouble with Student Locater Tool - this was addressed by staff. (Math) • Slow loading at times. (Math) • I needed help getting my maps to print correctly but got quick feedback support to remedy the situation. (Math) • A couple problems on the sixth-grade multiplication fractions worksheets; however, when we reprinted them it was fine. (Math)
Content availability (*n* = 5)	• The only challenges were the fact that there was a lack of fifth grade. During certain units I was teaching I would look to see if there was an ELM unit and often there was not until later or after I finished a certain unit. That was a little frustrating to be honest. (ELA) • I like it when ELM provides a text that is easy to use with the lesson rather than finding one myself. (ELA) • Answer keys to some of the activities. (Math) • One challenge was simply that I sometimes needed materials for a standard that did not yet have a unit created for it. (Math) • It was a challenge to implement some of the units since they were put out late in the school year. Sometimes that unit was already taught. (Math)
Needed modifications (*n* = 4)	• Sometimes I modified the activities to suit what we were doing. I noted this in the feedback survey. I also just completed two of the units here at the end of the year and will be doing the feedback in the next few days.

[11] Some respondents gave multiple answers, therefore, the total number responding to the question may not equal the number of bullet points.

Theme	Comments
	End and beginning of the school year are hard times to do surveys, etc. (Math) • Sometimes I needed to modify them. (ELA) • Some I had to modify. For example, I had to use Smarties instead of beans because I did not have any and I am unable to just run to the store since the closest store is an hour plane right away from where I am. I will be in a different school next year on the road system so hopefully that will be different. (Math) • I had to make a flip chart for each lesson of the units. (Math)
Student levels (*n* = 2)	• At time students were not used to the model presented in the unit and so there was a couple of day of pre- teaching prior to the units. (Math) • All ELM units were at grade level while I am teaching below grade level students. I had to re-teach skills missed before teaching an ELM unit. (Math)
Preparation (*n* = 1)	• I had trouble getting everything ready. (Math)
None (*n* = 3)	• None other than time. (ELA) • No notable challenges (Math) • I didn't have challenges implementing. (Math)

Table C4. Additional Information and Guidance for Supporting Implementation (*n* = 26, *n* ELA = 8, *n* Math = 18)[12]

Theme	Comments
Identified specific needs (*n* = 8)	• I would like to see more of the lessons with the actual text or texts that you could use with the lessons. At least a sample text for the first lesson that you teach then you could use your own text for a repeat lesson. (ELA) • I would like to talk with someone to enter my information. I have had a hard time making the chat session due to other commitments after school during the time of the chats. (ELA) • Kindergarten and first, I teach multi grades. (ELA) • A mid-year tutorial video on how to submit feedback, or regular links to go a do it. (Math) • Even though I got the maps figured out, I wish they were easier to print because I think the visual is really good for the students. However, with the complexity and dynamics of everything you can get from the map, I understand why it is so difficult. (Math) • I realized late in the school year that many of the ELM emails that were sent to my school address were delivered to my spam email so I was not seeing them. During training ELM staff should make a point of letting teachers know to check their spam box. I know that this is something that I did not think of and I randomly clicked on spam one day and saw the ELM emails. (Math) • More district supports. (Math) • My principal does not know about the ELM project. He does not support nor does not care about the program. It would be nice if ELM would provide a two-day training for all principals so that they may get an understanding of the program. (Math)
Did not request help (*n* = 5)	• I never reached out for help. Received many emails for help if needed. (ELA) • I don't really need any additional support. I did like the videos that were made. I think they were very helpful! (Math) • None. I find it easy to implement on my own now that I've had training. (Math) • None needed. Will have more flexibility in using the materials next year. (Math) • Nothing. (Math)
Support available if needed (*n* = 3)	• I had no contact from state contacts during the year. ELM staff did answer emails and I did a video chat. I think the support is there if needed. (Math) • I received the help I needed, so I have no suggestions at this time. (Math) • I felt I could call or email at any time to ask a question, etc. The ELM project people were always available and quick to respond. (Math)

[12] Some respondents gave multiple answers, therefore, the total number responding to the question may not equal the number of bullet points.

Theme	Comments
Incorporate with district-adopted curricula (*n* = 3)	• How to integrate with math lessons I must teach. (Math) • I did not take advantage of the staff I met in Kansas City to figure out how to embed the units into the curriculum. (Math) • If ELM units could be incorporated with Carnegie Learning, I would be able to use this across sixth to eighth grade when incorporating personalized learning. (Math)
Need renewal/ reengagement/ learning sessions (*n* =3)	• I need to learn more about the maps and spend more time working with them. (ELA) • It would have been nice to have a few more workshops offered to renew or reengage with the software. (ELA) • I have so many more questions for this year. It helps to know what I don't know. (Math)
Collegial Support (*n* = 1)	• I really liked the second training where I got to talk to colleagues who were doing the same thing as me and hear what they were doing with it, that helped me the most. (Math)
Need one-on-one help (*n* = 1)	• I might have used it had I gotten some one on one help connecting it to my curriculum map. (ELA)
Other (*n* =3)	• Contact with state (ELA) • I know that the people working with ELM are very busy, but sometimes I feel like I have to wait too long for responses when I attempt to contact them. (ELA) • Early in the year I heard from the ELM folks, and someone even came and did an observation during my lesson. But I haven't had anyone contact me in quite some time. (Math)

Table C5. Satisfaction with ELM Project Staff Engaging in Project (*n* = 21, *n* ELA = 5, *n* Math = 16)[13]

Theme	Comments
Helpful/supportive (*n* = 13)	• Always helped when needed. (ELA) • Anytime I had questions they were answered. (ELA) • This was a great project and the staff was AMAZING and supportive and went out of their way to be of assistance and support! (ELA) • You have done your job well, it is myself who has struggled. (ELA) • All questions that I had were answered quickly (Math) • Great! (Math) • I appreciate the immense support from the ELM staff. ELM staff has been extremely understanding during the duration of this project. They have been helpful and caring of all participating teachers. (Math) • The ELM project staff has always been very helpful and very positive! (Math) • The ELM project staff is extremely responsive and helpful with any struggles I had. They continue to work and stay in contact until everything is figured out. (Math) • The ELM staff has been extremely helpful with immediate solutions for any trouble I've had. They continue to expand and improve the project. I have loved using it! (Math) • The staff is wonderful and very engaging. I wish I had more time to be involved in the webinars! (Math) • They have always been very friendly, knowledgeable, helpful, and willing to make accommodations to fit the needs of what needs to be done to engage us in the project. They make it easy to ask questions and train what we specifically want/need. (Math) • We even had 2 staff members fly out here to Venetie, so I have received great help from the ELM project staff. (Math)
Frequent emails/ reminders/ opportunities (*n* = 5)	• Again, I know they sent several emails about webinars. I have taken on getting my TESOL at the same time so to be honest ELM was something I used when I needed extra resources, but not all the time. (ELA) • As stated above, I missed many emails so at first, I was dissatisfied this year with communication however this was not the ELM staff's fault. They did make an effort to send email communications. I was more satisfied the first year of the project, I believe that with many changes in leadership the communication and engagement may have suffered. (Math) • Liked that they kept us updated on how the site was updated and meetings to attend during the school year over the net. (Math) • Thanks for the consistent email reminders and chats. (Math) • They send friendly reminders, offer webinars, and are available when needed. (Math)

[13] Some respondents gave multiple answers, therefore, the total number responding to the question may not equal the number of bullet points.

Theme	Comments
Did not ask for help (*n* = 3)	• I did not seek out their support. (Math) • I was involved with a few webinars, but the activity after school with my family´s extracurricular did not allow me to continue with others. (Math) • They are amazing. (Math)

Table C6. Satisfaction with State Department of Education Engaging in Project (*n* = 20, *n* ELA = 4, *n* Math = 16)[14]

Theme	Comments
No contact (*n* = 13)	• I have not been in contact with them throughout this process. (ELA) • I didn't hear from my state department. (Math) • I didn't know about it until I happened to sit at a conference table with someone who was looking at it on their computer. When I asked about it, then I knew I could opt in, if I'd like. (Math) • I didn't really have any contact with my state department. I didn't really reach out to them, so I'm not dissatisfied. (Math) • I had no contact with the state about my involvement other than at the summer training sessions. (Math) • I have not heard anything from my state department in regard to the ELM project other than a two-minute conversation during the summer training. (Math) • I haven't had contact with the state department concerning the ELM project this year. (Math) • I went to a Missouri State Math meeting in the fall to present to fellow Missouri math teachers. I felt that we did a good job, but never heard anything further from the state people. They don't acknowledge what we are doing in either a positive or negative way. When we started last year at the meetings in Kansas City, Missouri didn't even have a representative there! At the fall meeting, the state math leader said the state was happy to be working with the project, but they have done nothing in my opinion to support that statement. (Math) • I'm not totally sure what this statement means. I have had no contact from Wisconsin this year. Unless I am mistaken I believe all contact has all come from Kansas. (Math) • No engagement was felt. (Math) • Other than the initial contact in Kansas I really didn't see any evidence that the state was interested in my implementation. (Math) • The only information and support I received came directly from ELM. My state department of public instruction has not reached out at all. (Math) • The state hasn't provided any support other than having the ELM training after the RTI training in January and offering credits for completing the training. (Math)

[14] Some respondents gave multiple answers, therefore, the total number responding to the question may not equal the number of bullet points.

Theme	Comments
Want more state involvement (*n* = 4)	• I appreciate that [State Department of Education staff] was at the meeting that I went in Jefferson City to help ELM with recruiting more people. I wish that she had come to the training last summer in Kansas City so that we felt like she was eager to take part in the project. (ELA) • It would have been nice if they had checked in part way through the year, but I get that they have very busy jobs. (Math) • I do wish my state had pushed more to involve others in the project. (Math) • I think my district would be more likely to pay attention to the work of ELM if the state provided more information to them. (Math)
State supportive (*n* = 3)	• Strongly supportive and helpful. (ELA) • The state department has been extremely supportive. I have seen materials with the pathways on them related to state assessments. (Math) • Very kind and energetic, makes me feel comfortable with trying something new and in the evolving stages. (Math)
Other (*n* = 2)	• Our state department is a mess right now. To be honest, I think they are probably doing the best they can. (ELA) • Well, our team disassembled so there are only four of us left. (Math)

Table C7. Open-Ended Evaluation Item: Use of ELM (*n* = 41, *n* ELA = 14, *n* Math = 27)[15]

Theme	Comments
Introduce new concepts/specific concepts taught (*n* = 18)	• I used [ELM units] in a couple of writing units when I needed a new example of how to teach a standard such as informative writing. I also used pieces of author's point of view and character traits. These I used the activities if not the entire lesson. I was looking for units to enhance my grade levels ELA instruction which I am responsible for writing all ELA curriculum. (ELA) • I used the third-grade writing units with my second and fifth graders. This was a great way to introduce second graders to informational writing and creating complete paragraphs, while it reinforced building a five-sentence paragraph with fifth grade. (ELA) • I used RI.4.2 - Writing a Summary with my fifth-grade group. It was a great way to reinforce summarization and to remind them how to create a thorough summary in writing. (ELA) • How to reteach main idea when the class was struggling. (ELA) • To focus on reading strategies. (ELA) • My students had a hard time with fables and understanding the moral of a story. So, I taught this lesson for all my small and whole groups. (ELA) • Yes. Compare/Contrast, Main Idea (ELA) • I have used six ELA lessons in the classroom. I did not use the maps in the classroom. (ELA) • Yes, I use it to see where kids have been to make introductory questions to lessons. I use it to show kids where they are going with the knowledge. I use it to enhance instruction - especially topics that are more difficult to students and I need "another way," (Math) • I used it in my class with adding and subtracting fractions. (Math) • It has also helped me think about how I introduce topics and how I go along the learning pathway within a topic. I think ELM has helped me approach teaching with a new perspective and has mostly influenced the types of questions I ask. (Math) • I used ELM units as part of a math workshop model making the activities written for teachers into activities written for small groups to work through together. (Math) • I used fraction unit as a reteach and order of operations as a reteach. (Math) • I used the instructional units in my classroom. The balance activity was wonderful in deepening students understanding of algebra.... the one that used cups hanging from string to weigh equations. (Math) • I used the maps for fractions. I teach three grades. I started with one concept and then added a node as they completed them. It showed which directions my students needed to go. I had several students that needed to go back due to missing sections and it told me exactly what to give the students so they could move forward. (Math)

[15] Some respondents gave multiple answers, therefore, the total number responding to the question may not equal the number of bullet points.

Theme	Comments
	• Integer examples with debit and credit. (Math) • I fully implemented the unit on eighth grade transformations using the Patty Paper and other teacher in my building who have not previously used Patty Paper also taught transformations using this method. (Math) • I also implemented several units doing the activities and the assessments. Using the formative assessment questions was a great help also since they matched specific nodes exactly. (Math)
Lesson planning (*n* = 8)	• To provide a scope and sequence. (ELA) • Yes. I implemented a lesson on folktales and another in writing informational text. (ELA) • I have used the map to help me lesson plan to see where students should be and where they are going next. (Math) • After determining what needs they have, I have been able to pull the lesson needed to help them. (Math) • I teach a diverse group of lower learners in the high school setting, so the maps are helpful in finding gaps and creating a plan for instruction so I can individualize their work and keep them moving towards their goals. (Math) • It helps the students see what they have accomplished by the end of the trimester and see the depth of their learning when we look at the picture as a whole. (Math) • I've been using the ELM software during my lesson planning using district materials. I insert the intended skills of the curriculum in the ELM software. When nodes begin popping up, I develop diagnostic assessment questions based on the nodes. When I begin to notice patterns of mistakes with the different nodes, I work with students in groups of provide classroom instruction on specific nodes. (Math) • I used them to help me plan sequences of lessons within a unit. (Math)
MTSS/Intervention/ Struggling students (*n* = 7)	• Secondly, when I am teaching a unit, and I know how to teach a unit, I teach skills based on my knowledge and understanding. When I begin to notice students failing to understand skills, I go to the ELM software and pick out the nodes where my class is failing to understand. I take those specific nodes, and I develop classroom activities. Once I know when students have gained an understanding, I develop simple diagnostic assessments, and I move on to my unit of study. (Math) • I used it in my MTSS group quite a bit. (Math) • To teach intervention students. (ELA) • I also used them with my MTSS groups to help work on first grade standards. (Math) • I have used the map to not only teach six standards in my classroom but also to address students who struggle with math skills and seem to have gaps in their learning. (Math) • I taught a few math units to struggling students in fifth grade. I used the maps to help gauge where each student was and where they needed to go in their learning. (Math) • I have used it with students who were struggling with a concept. (Math)

Theme	Comments
Identify/measure student learning targets (*n* = 6)	• Identifying precursor skills students need to have in order to master the taught standard. (ELA) • By utilizing the maps, I have been able to better target where my students are in their learning. (Math) • Once they have mastered a past strategy, I can then move them forward more quickly. (Math) • I have used five different lessons with resources. I had students color learning maps according to what they know, kind of know, or have no idea. (Math) • I printed the base map for every student prior to starting the unit as an overview of what we will be accomplishing this unit. (Math) • Read through the nodes before beginning each unit. Used map as a visual throughout unit. (Math)
Identify/remediate student learning gaps (*n* = 5)	• I have used it to close gaps in students learning. I have also used it to help identify special education referrals. (Math) • Some of my students were having trouble figuring out how to solve volume problems involving rectangular prisms. I found the standard that related to that content. After I started going through this with them, I noticed that the students knew what to do to solve the problems. The area that they struggled in was multiplying the three numbers. So, I went back to that standard and practiced how to multiply the numbers. (Math) • Thirdly, I have been the ELM software when teaching an ELM unit. I pick out a unit, and use the nodes as a guide to develop diagnostic assessment questions. Using these questions, I develop different units and classroom activities to re-teach missed skills. Then I commence to teach the ELM units. (Math) • Finally, I've been using the ELM software as a diagnostic tool. I've been developing test questions of different kinds before I teach a unit. These allow me to start where my students are not successful. Once I know where to begin, I usually generate different nodes for students, groups, and the class. In the end, students begin to learn all my intended goals during a unit of study. (Math) • I also used the units and assessments from below the seventh-grade level with individuals who are missing conceptual understanding of concepts such as multiplying, dividing, and fractions. (Math)
Connect to current lessons (*n* = 4)	• Connecting with current ELA lessons being taught. (ELA) • I used the maps to help my students with writing an opinion about an informational text. (ELA) • I also used the math maps to help with some gaps my students were having with subtraction. (ELA) • I've used learning maps to teach long division to my students, where I had a larger majority of my students know the purpose and meaning of division than any other class I've taught. I also taught reading point of view of an author and found my students really enjoyed the lessons. They've gotten a lot better at every lesson I taught using the ELM units. (ELA)
Grouping (*n* = 3)	• I have several small group guided reading groups that I work with. I used the maps for second, third, and fourth. I also used the maps for whole

Theme	Comments
	group lessons for second, third, and fifth grade ELL [English language learner] students. (ELA) • My colleagues and I grouped our learners based on their area of need. We used MAP Skills data to determine their area of need. Then we each taught several ELM units. (Math) • I have used the map to teach guided math groups. This has allowed me to help the lower learners in my class to help them fill those gaps that they are missing. (Math)
Supplement materials (n = 3)	• Supplementing instructional resources. (ELA) • I printed out the learning maps for specific math units. I went over the nodes with students and we discussed what they already knew and where they were going in their learning. When they showed understanding (by interview, test, etc.) the student could color in the nodes that they understood in green. (Math) • I used the units as whole class activities. It has helped me to see where our textbook is missing some standards or does not cover them as in depth as is necessary. (Math)
Connect to standards (n = 2)	• Deconstructing CCSS [Common Core State Standards]. Creating priority standards. (ELA) • Yes, it is part of my planning for my standards ELM has become an essential tool for my multi-grade classroom. (ELA)
Did not use (n = 2)	• I have not. (ELA) • Too time consuming to use. (Math)
Other (n = 4)	• The questioning has helped shaped how I myself approach student questions. (Math) • I have used it to help re-teach concepts learned in the given curriculum that I felt students needed additional practice on. (Math) • I supported a sixth-grade teacher in implementing the maps and lessons in her classroom. (Math) • I used ELM to communicate my curricular plans to students, parents, staff, administration, and my student teacher. They all appreciated the ability to see the progression and sequence of content that is being taught. (Math)

Table C8. Open-Ended Evaluation Item: I used to …. But now I …. (*n* = 37, *n* ELA = 11, *n* Math = 26[16]

Theme	Comments
Teacher directed learning…student directed learning (*n* = 11)	• I do a lot more questioning and reflecting, I used to reteach and go over the same materials slower, now I plug in the map and see where the students are missing the information and have gaps and I target that area and the level of success is far greater. I have found that going back through the missing parts of their learning has made the gaps in understanding disappear. Students are more relaxed as they are able to have a deeper understanding. I used to get blank looks and now I get engaged learners! (ELA) • I used to do a lot of the talking or delivering of information but now I let students direct or guide our learning more. (ELA) • I used to do a lot of talking and explaining, but now I inquire and question their reasoning to gain further understanding of what they know. (ELA) • I used to do a lot of talking to the students but now I try to find ways to get them talking to each other. (ELA) • I used to do a lot of showing how to do a math problem, but now I let them figure it out and show me how they did it. I used to do more "teaching", but now my students do more sharing of ideas and teaching each other. I used to tell students what they were going to learn, but now I teach to a specific target and use the map to help students see the target. (Math) • I used to talk more and now I listen more and let students discuss math themselves. (Math) • I used to do a lot of explaining, but now I do a lot of questioning is a great one. This has been a goal for several years, but ELM has helped even more. (Math) • An original one could be I used to spend a lot of time looking for progressions, but now I use ELM and it is at my fingertips. It has helped to be able to go back several steps when necessary. (Math) • I used to think about teaching the curriculum, but now I plan on printing learning maps to allow student to create learning target goals. (Math) • I used to do a lot of talking, but now I do more listening and allowing students to struggle a little to "figure things out." (Math) • I used to do a lot of demonstrations but now I allow time for my students to show their thinking. (Math)
Figure out gaps…evidence of specific gaps (*n* = 6)	• I used to think that I could just figure out what was missing when students were not successful, but now I have a resource to help me find the solutions! (ELA) • I used to guess what students were struggling with but now I can figure out exactly what they're struggling with. (Math) • I used to have to try to figure out what skill we were missing from the past. But now, I can determine the skills needed based on the maps. (Math)

[16] Some respondents gave multiple answers, therefore, the total number responding to the question may not equal the number of bullet points.

Theme	Comments
	• I used to think I knew where the students were on the map in my head, but now I have a map and can show them where they are in learning. (Math) • I used to think that students had gaps that needed to be filled, but now I think they have different background knowledge and I'm not filling a gap but taking them down a different path to understanding. (Math) • I used to make an educated guess about what students needed if they weren't understanding, now I have a structure that I use to help me. (Math)
Rely on single strategy or resources (district-adopted curriculum) …broad perspective (*n* = 4)	• Rely solely on the curriculum materials my district provides to teach the math standards but now I feel as though I have widened my perspective and found many resources to address students' learnings and needs when teaching standards. I also love the elicit questions in the lessons to be able to verbally assess students learning and perspectives. (Math) • I used to try to just teach three groups, one for each grade level, but now I start with a concept and then try to individualize the learning for each student. (Math) • I used to use a district provided curriculum, and taught students how I have been taught in school. For instance, I would use the district provided curriculum on learn about column addition. I would delve right into the algorithm of column addition to teach students the skill. I now use the ELM software and teach other functions and skills related to the intended skill. I then use different concrete functions to teach a skill based on the understanding of the students. I continually make changes to how I teach during the class. My lesson is never the same in the start to the end, and I add or subtract different concepts to my learning goals. Furthermore, students are the ones doing, learning, and making while I do a lot of questioning, guiding, and changing the content minute by minute, second by second. (Math) • I used to provide one method of explaining a concept. Now I have another resource to explain misconceptions in a different way. (Math)
Look for other resources… use ELM (*n* = 4)	• I used to go to other sources for enrichment activities but now I consider what ELM has to offer students and staff. (ELA) • I feel I have a resource to go to for a struggling learner. I appreciate the map that gives insight to gaps that need to be filled for those struggling in specific areas. (ELA) • I used to have to pull materials together to work with students, but now I can go to one location and figure out what skill my students need to work on and have materials readily available to move them from manipulatives to abstract. (Math) • I used to struggle to find quality materials that engage students while leading them through all the pieces of content they need, but now I go to ELM first and am rarely disappointed by what I find available (I'd love even more units, though!!). (Math)
Do lessons… target student learning goals (*n* = 3)	• I used to focus mostly on the current and future learning targets, but now I also consider past learning targets including learning targets from several grades prior. (Math)

Theme	Comments
	• I used to just teach lessons without much regard to the outcome. Now I can give my students a clear understanding of what they are going to learn and how I am going to assess their learning. (ELA) • I used to just look at the standard and teach that but now I look at the map and figure out why the student is having difficulty and use the map to figure out how to help that student better. (Math)
Move on… form connections (*n* = 3)	• I used to just move on to the next lesson, but now I think about how everything is connected. (Math) • I used to consider progression of skills, but now I look at a greater detailed list of skills. (Math) • I used to assume I knew all the steps from lesson one to the final lesson in a math unit, but now I realize how many layers of knowledge fall in between those two steps and I'm able to help my students every step of the way. (Math)
Formal/end-of-unit assessments… assessment during instruction (*n* = 2)	• I used to use a lot of formal assessments to measure student progress, but now I use more formative assessment to measure students' understanding. (ELA) • I used to do a lot of assessing at the end of units but now I try to find ways to assess throughout what I am teaching and do it in a variety of ways. (ELA)
More questioning (*n* = 2)	• I used to not ask good questions during instruction but now I have better questioning skills. (Math) • I am doing more questioning than before. (Math)
Specific tools (*n* = 2)	• I used to use red and black integer chips to add and subtract integers, but now I use the piggy bank debits and credits method. (Math) • I used to look at each unit part by part and now I read through the teacher's notes and come to an understanding of not only where I am going, but what learning and/or misconceptions will happen along the way. (Math)
Skim concepts… go deeper (*n* = 1)	• I used to "skim" the surface of some concepts but now I am able to go deeper and more thoroughly cover the concept. (ELA)
Prep work…resources available (*n* = 1)	• I used to do a lot of prep work in finding appropriate strategies and now you have done the research for me. (ELA)
No change (*n* = 1)	• To be honest it didn't change my thinking, but I was already in complete agreement with the philosophy embraced by ELM. ELM has provided with high quality resources, so I don't have to create my own! (Math)

Table C9. Open-Ended Evaluation Item: Formative Assessment (*n* = 40, *n* ELA = 13, *n* Math = 27)[17]

Theme	Comments
Methods (*n* = 11)	• I am more active in listening and questioning. (ELA) • I am more aware of visually assessing individual students daily, instead of waiting for a paper/pencil test to assess. (ELA) • I give lot more smaller assessments. (ELA) • I realized how much formative assessment that I do within my classroom. I just wasn't realizing that I was doing it. (ELA) • Again, ELM has not changed my view, but it has simplified the process for me by providing high quality examples that are built into the materials, so I don't have to create my own formative assessment. (Math) • Formative assessment does not need to be time consuming. It can be questioning techniques and built into everyday instruction. (Math) • I am not sure that it has changed but has become easier with the materials. (Math) • I had a great understanding of what formative assessment is, where I struggled was giving meaningful feedback that moved students forward. I feel better equipped to know what questions to ask, and what to look for in their answers, to be able to plan next steps. (Math) • I was already doing quite a bit of formative assessment. I guess one change would be my view on the "grading" of assessments such as exit tickets. If formative assessment is driving your instruction by letting you know what students need, should they be graded? (Math) • It does not need to be a formal quiz or test to gain an understanding of students understanding of concepts. A good question, exit ticket, or 1 problem can be used to assess learning. It is more on the fly assessing of students. (Math) • It is the same, except I execute it differently. I walk around the room listening instead of just quizzing. (Math)
No change (*n* = 10)	• Stayed the same. (ELA) • Formative assessment is something our district strongly supports and it has not changed my understanding using ELM. (Math) • I don't really think my understanding of formative assessment has changed. We do formative assessment all the time at my school. (Math) • I have always had a strong understanding of formative assessment. (Math) • It has not changed I use this is my every day classroom. (Math) • That area has not changed much as I have always believed in the power of formative assessment and "dip sticking" to see where the kids are and what you need to tweak. (Math) • It has not. (Math) • It has not. I have always used frequent formative assessments. (Math) • Just more informed now. (Math) • No. (Math)

[17] Some respondents gave multiple answers, therefore, the total number responding to the question may not equal the number of bullet points.

Theme	Comments
During instruction (*n* = 9)	• Formative assessment is the foundation of student learning and academic growth. (ELA) • I have been reminded to do quicker on the spot assessments of student understanding. I now work to check understanding throughout the lesson on the run, as we go. (ELA) • I now know that formative assessment is a practice that is naturally embedded into instructional lessons. I used to think formative assessment was a formalized assessment process. (ELA) • I view it as a process more than just an assessment. It has the student fully in mind and they are guiding the assessment along. (ELA) • I'm using it constantly and multiple times during my lessons. (ELA) • Dr. Margaret Heritage's presentation during the summer training was helpful to my understanding of formative assessment. I realize now that certain questions if asked well can be an effective formative assessment. (Math) • Formative assessment is ongoing assessment and helps teachers to modify and adjust their teaching to match what the student needs. (Math) • I am now assessing my students at the end of each lesson instead of just waiting for a quiz or test. It makes it easier to get the students where they need to be to reach their learning goals. (Math) • The progressions have helped a lot for my understanding and for meeting with other teachers to develop a plan for how to teach because of what is coming. (Math)
Increased awareness of student learning (*n* = 5)	• It has made me more aware of the abilities of my students and how to assess them. (ELA) • Formative assessments should be giving to students to prove the knowledge that they have learned. (Math) • I have a better understanding of what students need, rather than just grouping them together. (Math) • I have done a lot of work on improving the quality of my teaching outside of ELM training, but everything that I've learned in ELM has validated the things I'm striving to do. I find myself using formative assessment all along the way now and changing my teaching to meet the students' needs rather than just checking off who is struggling and not knowing what to do about it. (Math) • Yes. Minute by minute, second by second. I even take time during my lesson to force myself to check the understanding of the students. (Math)
No change… but (*n* = 5)	• I had a pretty good grasp on formative assessment before ELM training so other than additional ideas no real earth-shattering change. (ELA) • It hasn't, I have taught classes on formative assessment in our district and felt like this area of the training was not deep enough. (ELA) • I have always done formative assessment, but now I am much more purposeful in what I am assessing and how. (Math) • It is about the same only because I took an entire class on formative assessment prior to this. (Math) • Not a whole lot of change in my understanding of formative assessment, I just now have more ideas of how to implement it using questioning and problem solving. (Math)

Table C10. Open-Ended Evaluation Item: Personalized Instruction (*n* = 39, *n* ELA = 12, *n* Math = 27)[18]

Theme	Comments
Instructional tool (*n* = 20)	• I can address the gaps in mastery with my students by using the rubrics. Then I can reteach the lesson to a smaller group of students. (ELA) • I have started to think more individually about instruction, but I still have a long way to go. (ELA) • I now see different avenues for personalized instructions and ways to adjust a lesson up or down (ELA) • The ELM has provided a nice resource for me to refer to when needed. (ELA) • The ELM has been a tool that has made that process of planning for all the students more exact and effective. (ELA) • Coming from a background in special education, I can't say that it has changed much except for the fact that I have information and materials easily assessable which means I can get students going on their individual pathway quicker. (Math) • I feel more confident in what I need to do to move students to the next challenge. (Math) • I found that I could often form small groups for specific instruction based off the answers students gave to questions and using the assessment explanation page. That would tell me the specific misconception, so I could specifically address that need. (Math) • This research-based map has provided me with a solid tool for personalized instruction. • I have a greater depth of knowledge to draw from and can help students make connections to elementary concepts they are good at so they can also be good at the algebraic concepts. (Math) • I use a guided math format. Formative assessment allows for the gathering of information that helps me to form groups based on students' particular needs. Groups are fluid based on this data. (Math) • It has provided me additional tools for instruction. (Math) • It is better and more individualized. (Math) • It is more individualized for each student. (Math) • The maps help with individual instruction by providing a road map for individual instruction to see what students should have already learned and what they should be learning next. (Math) • The maps help you know how to personalize each student's learning path, with the same objective in mind for all students. (Math) • There are so many resources to go with the maps. The maps have helped me with the progression before seventh grade. I now have a better understanding of helping students of all levels. (Math) • This resource is excellent because it is a visual for each student to see where they are. (Math)

[18] Some respondents gave multiple answers, therefore, the total number responding to the question may not equal the number of bullet points.

Theme	Comments
	• Using the learning maps has increased students' awareness of their own learning. Students are able to understand more about what questions to ask. I do not get the "I don't understand" or "Can you help me?" as much. Students are more aware of how to ask for help. (Math) • Using the ELM maps allows me to do this without much prep or thought. It is just a matter of having maps for each big idea at my fingertips and looking for the skills preceding and the skills following each concept. (Math)
Change in practice (*n* = 10)	• I've gone from giving the majority of my lessons lecturing and speaking to almost half that time explaining and giving more time for students to test and practice what is being taught. (ELA) • The ELM has given me a way to teach in multi-grade level in a more profound way. In multi-grades there are also differences in levels. Large differences in abilities along with multi-graded classes creates a need for individual learning plans which take a lot of time. (ELA) • In the past, I would do my best in identifying precursor and enrichment skills. Now, I use the map to identify these skills. (ELA) • I am now using a math workshop model which allows the students to personalize the pace of their learning. Students work through lessons at their own pace while I use conferencing and small group lessons to do 'on the spot' differentiation. I'm able to support my students who struggle with immediate interventions and challenge my students who need it with immediate differentiation. (Math) • I am able to be intentional about lessons to target student learning. (Math) • I am doing personalized instruction more. I thought I was doing good with it before I started with ELM. However, using the maps allows me to truly individualize the instruction for each student. (Math) • I can tailor my lessons to an individual or a small group. (Math) • I think the learning map has the potential to help provide personalized instruction, but I just got into the rhythm of the year, and didn't take the time to learn more about it. (Math) • Using the maps has allowed me to create lessons for individual students so they can either catch up or excel. (Math) • I will definitely implement it even more next year because I am getting more comfortable with it and see the value of the research that has been done. (Math)
Identify/remediate student learning gaps (*n* = 5)	• I have another tool to help me help the kids. (ELA) • It allows me to see where my students are and where they need to go. It gives me a road map. (ELA) • The maps help me to be able to identify what the students are missing and see where to go next or what to go back to. (ELA) • The maps have allowed me to identify skills my students need to master before they are able to master the intended standard. The maps have also provided me with specific enrichment skills students can learn once they have mastered the intended standard. (ELA) • It has allowed me to find gaps and fill them in on an individual basis. (Math)

Theme	Comments
Need help/practice (*n* = 5)	• This is an area I can use more help in to be honest. I am still a little stuck in trying to use the same formative for all. (ELA) • This is still a struggle because I have lots of students who are low. (ELA) • It is still a growth area for me. I agree with the philosophy but struggle to find the time to put it into practice. (Math) • My knowledge of what to do and who needs what is much better, but the classroom management around stations and being able to give my 100% to a small group while others are self-sufficient needs work. (Math) • To provide personalized instruction, I need additional practice to allow this to happen in my classroom setting. (Math)
None (*n* = 3)	• No (Math) • None. I am not good at this. Or maybe I do it and not realize it. (Math) • Not as a result of this program. (Math)
Other (*n* = 1)	• Generally, teacher to a teacher who makes changes and is adapted to changes. (Math)

Table C11. Open-Ended Evaluation Item: Changes in Student Learning (*n* = 32, *n* ELA = 9, *n* Math = 23)[19]

Theme	Comments
Student ownership of learning (*n* = 8)	• By using the maps, I can show my students where they are and where we are going. The students like having a strong sense of accomplishment when mastering a skill. (Math) • Being able to see what necessary skills the student is lacking gives them more ownership and helps them know what to make goals around. (Math) • I liked having the breakdown of errors to help address misconceptions. (Math) • My students love seeing the maps. They keep track (by coloring in) of the nodes they feel they are mastering. They ask about the nodes we haven't yet explored. They can understand the language of the nodes and appreciate knowing what skills follow current classwork. (Math) The activities in the units are perfect! At times I struggle to find materials that engage the students thinking and allow them to explore a topic rather than be told about a topic. ELM units are always full of quality activities. (Math) • Students enjoy the materials. It starts them out with manipulative/pictorial then progresses. (Math) • Students in second grade like tracking their progress to goals. They know what they need to learn and work to get there so they could color in the nodes. (Math) • Students like to see progress and I can get buy in to what I am doing when they can see it carries through to another topic and grade level within the maps. (Math) • They knew where to go and what to do next when given time to work on expanding their knowledge. (Math)
Improved understanding (*n* = 8)	• They can understand concepts on their own level and progress towards their personal goals. They are given on target instruction by their aides. (ELA) • I have more students able to understand the second-grade standard. (Math) • Some students could grasp the concept(s) better with the support of the ELM lessons. (Math) • Students buy in to their own learning. Student understanding of how things are connected. (Math) • Students seemed to understand the concepts of weighing better and they seem to be able to formulate answers to essential questions better. (Math) • The Patty Paper lesson plan has helped students gain a better understanding of transformations. (Math) • Students were able to explain their thinking better. (Math) • I also observed greater understanding of place value with this year's students after implementing the place value unit. Lots of hands on activities

[19] Some respondents gave multiple answers, therefore, the total number responding to the question may not equal the number of bullet points.

Theme	Comments
	to build their knowledge and the place value cards were perfect! Expanded form was so easy for them to understand after using them and the activities in that unit. (Math)
Teacher-focused response (*n* = 7)	• Using standards to guide instruction and finding the standard/skills that the student is lacking. (ELA) • Adding an extra layer for fourth grade writers who needed challenge. Modifying to above grade level readers. (ELA) • My teaching already closely mirrors the deep questioning and exploration that is present in the ELM units. Therefore, my learners did not necessarily "change." However, the units streamlined the process of for me. (Math) • Better questioning during instruction. (Math) • The map has helped me explain to students where their learning gaps are. (Math) • I've found fewer 'gaps' in my students' knowledge. When planning my lessons, I am noticing the 'in between' nodes that often were not part of my planning of units in the past. By taking time to map out the progression I'm finding a lot of steps prior to the conclusion of learning that enhance comprehension. (Math) • I used ELM to communicate my curricular plans to students, parents, staff, administration, and my student teacher. They all appreciated the ability to see the progression and sequence of content that is being taught. (Math)
Deeper understanding (*n* = 6)	• Student discussion and work was at a deeper depth of knowledge level because of the ELM. (ELA) • Deeper questioning (for me) and deeper understanding (for students). (Math) • I find the students have a deeper understanding of the skills. (Math) • I have noticed that my students are a little better at realizing what they are unable to do. Instead of getting "I don't get it." I get "I am having trouble with finding the common denominator." (Math) • Questioning their thinking. (Math) • Student responses are deeper because of the questions I am asking. Retention is better. (Math)
Improved student skills (*n* = 5)	• I feel like the fifth graders have done a better job of summarizing after the unit on it. Their written summaries are shorter, but include more good information. (ELA) • I feel like all the students with whom I did the information writing unit with produced better examples of facts and examples to support their main ideas. (ELA) • Using nonfiction strategies. (ELA) • Reading and understanding folktales. (ELA) • When solving problems, I would notice the students using strategies that I taught them for the learning maps. (Math)
Increased confidence (*n* = 4)	• I've noticed a lot more confidence in my students. (ELA) • I feel as though I am able to encourage and build confidence in my struggling students by showing them that they are learning and on the correct path even if they are behind or don't learn in the same way that their peers may learn the skills we are addressing. (Math)

Theme	Comments
	• I have seen students grow in different ways after using the ELM software. I was teaching students how to multiply. I kept getting varying results until I looked through my ELM software. This allowed me to see, visually, the specific skills that I missed for my class. I had to teach students extended addition, the function of extended addition, and teaching students the relationship of extended addition to multiplication. I had missed this skill and I created classroom activities based on these nodes. Once students realized this relationship, they also understood turn around facts using manipulatives. I began to see positive changes toward math from my students. They became more confident math students. They have been very excited to learn math since they are beginning to learn the functions and the concepts of math. (Math) • My students have developed a more confident approach to learning (especially in math). (Math)
Other (*n* = 3)	• The way they are engaged in the lessons and the motivation of learning. (ELA) • I found that the students were able to evaluate themselves with the rubrics. (ELA) • Students were more engaged. (Math)

Appendix D: Interview and Focus Group Protocols

ELM Project Staff Year 3 Evaluation Interview Questions

INTERVIEW INTRODUCTION:

[Introduce yourself and explain that you work for McREL, the external evaluator of the Enhanced Learning Maps (ELM) Enhanced Assessment Grant (EAG).]

I'm talking to you today to gather your feedback and insights about the ELM project and its implementation thus far. Information collected during the interviews with partners, along with findings from participant focus groups and surveys, will be used to assess the implementation and initial impact of this three-year project.

I will report these findings at the project level, so everything you say will be analyzed and reported with responses from other project staff. Please be assured that your anonymity is protected and your name will never be linked to your responses.

I will be audio recording our discussion today to assist me with note taking. McREL evaluators will be the only individuals with access to the recording. Once we have the report completed, we will erase the recording. [*IRB consent forms will be distributed and signed consent forms received back by McREL evaluator prior to conducting an interview.]*

I anticipate the interview to take about 30 to 45 minutes to complete. Do you have any questions before we start the interview? *If yes, answer questions, then proceed with interview.*

1. Describe your involvement with the ELM project. What is your role?

Project Implementation

2. How familiar are you with the original project proposal? *[Interviewer note: There are a number of staff who are newer to the project. If they indicate they are not familiar with the original project proposal, do not ask the follow-up questions below.]*

   To what extent is the ELM project being implemented as proposed? If the project is not being implemented as proposed, what adjustments have been made in the project plan?

Project Implementation and Support

3. To what extent are the teachers implementing the ELM units and learning maps in the ways you had intended? Explain.

4. How have the ELM project staff supported the teachers' implementation of the ELM project activities in their classrooms?

External Communication/Collaboration – ELM Project Staff and Partners

5. Describe the communication and collaboration among ELM project staff and the state partners. (Probe for nature, frequency, and mode of communication.) *Note:* ELM project staff and state partners have had webinars approximately every other month as well as various e-mail communications.

6. In what ways was input provided by the state partners and Governance Board members taken into consideration?

7. On a scale of 1 to 5, where 1 is not at all satisfied and 5 is very satisfied, how satisfied were you with the communication and collaboration? Why did you give it this rating? (Probe for what aspects of the communication and collaboration have been most/least satisfactory.)

Internal Communication/Collaboration and Support

8. Describe the communication and collaboration amongst the ELM project staff. (Probe for nature, frequency, and mode of communication.)

9. On a scale of 1 to 5, where 1 is not at all satisfied and 5 is very satisfied, how satisfied were you with the communication and collaboration with your ELM project colleagues? Why did you give it this rating? (Probe for what aspects of the communication and collaboration have been most/least satisfactory.)

10. What type of support do you need to successfully undertake your roles and responsibilities as it relates to the ELM project?

11. Has the work you have been assigned on the ELM project aligned to the job expectations for your role? Explain.

Reflections and Reactions to Surveys and Focus Groups Findings

12. What surprised you most about the surveys (Cohort 1 and 2 Spring 2018 survey, state level training surveys) and Cohort 1 and 2 focus groups findings?

13. Based on the findings from the surveys and focus groups what were you most pleased about?

14. Based on the findings from the surveys and focus groups, what do you think need strengthening, improvement, and/or attention (from a programmatic standpoint) as you move into the final year of the grant?

Project Successes and Challenges

15. What have been the successes of the ELM project to date?

16. What have been the challenges of the ELM project to date? How have the challenges been addressed?

Sustainability

17. What are the plans for sustainability with each of the states for the use of the Enhanced Learning Maps and resources following the conclusion of the Enhanced Assessment Grant?

18. How could the ELM project be replicated for use by other teachers? What would need to happen for other teachers to successfully use the Enhanced Learning Maps and resources?

Wrap Up

19. What additional comments or suggestions about the implementation of the ELM project do you have?

ELM Project State Partners Year 3 Evaluation Interview Questions

INTERVIEW INTRODUCTION:

[Introduce yourself and explain that you work for McREL, the external evaluator of the Enhanced Learning Maps (ELM) Enhanced Assessment Grant (EAG).]

I'm talking to you today to gather your feedback and insights about the ELM project. ELM staff plan to use findings from this interview to inform any adjustments that may be needed and to help describe the implementation of the project.

I will report these findings at the project level, so everything you say will be analyzed and reported at the aggregate. Please be assured that your anonymity is protected and your name will never be linked to your responses.

I will be audio recording our discussion today to assist me with note taking. Once we have the report completed, we will erase the recording.

I anticipate the interview to take about 30 minutes (or 45-60 minutes for a group interview). Do you have any questions before we start? *If yes, answer questions, then proceed with interview.*

The project is concluding its third of the four years. The final year (2018-2019) focuses on scale-up of the ELM project in each state and research on the impact of the learning maps on students.

1. To what extent was the ELM project rolled out in your state in the way you had anticipated or planned?

2. Were you able to recruit the number of teachers in each of the three years that were targeted?

3. What made recruitment efforts successful? What were challenges encountered during recruitment?

4. What lessons can be learned about recruitment that would be useful for future projects such as these?

5. ELM project staff offer many supports to aid teachers in the implementation of the learning maps and units (e.g., project staff support via phone, e-mail, video; archived support webinars; ELM support chats; newsletters; ELM website). Are there any additional supports do you believe would help the teachers implement the ELM unit?

6. Describe the communication and collaboration among ELM project staff and the state partners. (Probe for nature, frequency, and mode of communication.)

   Note: ELM project staff and state partners have had webinars approximately monthly (or every other month) as well as various e-mail communications. One area the state partners

were specifically requested to assist was in the recruitment of English language arts and mathematics teacher participants.

7. On a scale of 1 to 5, where 1 is not at all satisfied and 5 is very satisfied, how satisfied were you with the communication and collaboration? (Probe for a rating from each interviewee if a group interview.) Why did you give it this rating? (Probe for what aspects of the communication and collaboration have been most/least satisfactory.)

8. What do you see as the successes of the project to date (consider both implementation and the intended outcomes) (Reminder: The goal of the ELM project is to improve teachers' ability to provide personalized instruction by supplying them with the tools they need to implement effective formative assessment practices.)

9. What do you see as the challenges of the project (consider both implementation and the intended outcomes)?

10. What are the plans for sustainability in your state for the use of the Enhanced Learning Maps and resources following the conclusion of the Enhanced Assessment Grant?

11. Does your state have plans to scale-up the use of the Enhanced Learning Maps and resources to more teachers in the state following the conclusion of the Enhanced Assessment Grant? Explain.

12. How could the ELM project be replicated for use in other states? What would need to happen for other states to successfully use the Enhanced Learning Maps and resources?

13. Is there anything else that you would like to share about your experiences (or those of the teacher participants) in the project?

Cohort 1 and 2 Teacher Focus Group Protocol
Summer 2018

[*Introduce yourself and explain that you work for McREL, the external evaluator of the Enhanced Learning Maps (ELM) Enhanced Assessment Grant (EAG).*] I'm talking to you today to gather your feedback and insights about the ELM project. ELM staff plan to use findings from this interview to inform any adjustments that may be needed and to help describe the implementation of the project. The ELM state partner may opt to participate in the focus group so that she or he may have the opportunity to hear firsthand of your experiences with the project and consider any additional support that may facilitate the project's implementation.

I will report these findings at the project level, so everything you say will be analyzed and reported at the aggregate. Please be assured that your anonymity is protected and your name will never be linked to your responses.

I will be audio recording our discussion today to assist me with note taking. Once we have the report completed, we will erase the recording.

I anticipate the group interview to take about one hour to complete. Do you have any questions before we start the group interview? If yes, answer questions, then proceed with interview.

Introductory Questions

1. How many of you are participating in the project using the ELA resources? Mathematics resources?

2. How many of you are Cohort 1 teachers (i.e., participated in the summer 2016 training)? And, the rest of you were Cohort 2 teachers, correct?

Implementation

3. ELM project staff has several expectations for the teacher participants (e.g., attend summer training in Kansas City, implement six units and provide feedback via surveys, participation in evaluation surveys). Are those expectations reasonable? Why or why not?

4. Are the ELM materials and resources easy to use and teacher friendly? Explain (Probe on each and bring samples to help with recall).

- Learning Map Document,
- Teacher Notes [a synopsis of relevant research with links from the research to other materials in the unit],
- Teacher Notes videos,
- Instructional Activity,
- Student Activity,
- Student Activity Solution Guide,
- Instructional Activity Handout,
- Instructional Activity Supplement,
- Student Locater Tool

Impact

5. How is participating in the ELM project influencing how you think about teaching and student learning?

6. How are the maps helping you with addressing the guiding questions: Where am I going with the lesson? Where am I now? Where to next?

7. Thinking about your use of the ELM learning maps and resources, consider the following question and how you would respond,

I used to …. But now I

(Use the following examples if necessary to get participants thinking about possible responses.)

- *I used to do a lot of explaining, but now I do a lot of questioning.*
- *I used to do a lot of talking, but now I do a lot of listening.*
- *I used to think about teaching the curriculum, but now I think about…*

Supports and Challenges (Q8-12 will be asked if time)

8. To what extent did the summer training(s) prepare you to implement the ELM instructional units? Explain.

9. To what extent is the availability of ELM project staff via email and phone helpful as you are implementing the ELM instructional models? Explain.

10. What other supports are facilitating your implementation of the ELM instructional units? Consider supports provided through state education agency, district contact, and school/building principal.

11. What challenges are you experiencing when you implement the ELM instructional units in your classroom?

12. What did you do to address these challenges?

Wrap-Up

13. Have you or will you recommend the Enhanced Learning Maps to a colleague? Why or why not?

14. Is there anything else that you would like to share about your experiences in the project?