



*Making
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Enhanced Learning Maps Project Year 2 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), formerly The Center for Educational Testing and Evaluation (CETE) at the University of Kansas coordinates the project and it is administered by the Kansas State Department of Education. Additionally, there are three other state education agencies (SEA) collaborating in the project. Those SEAs include the Alaska Department of Education, Missouri Department of Education, and the Wisconsin Department of Public Instruction.¹

The overall 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 2 evaluation report encompasses the time period from October 2016 to September 2017 and focuses primarily on the project's implementation from the perspectives of the teacher participants, partners and project staff. Initial perceptions of impact on instructional practice are also provided. The following are the conclusions and recommendations drawn from a comprehensive review of the findings.

Conclusions

Conclusions are organized around four areas which align to the primary areas evaluated. Those areas include recruitment, expectations and implementation; impact on instructional practice; summer 2017 training; and communication and collaboration.

Recruitment, Expectations and Implementation

Recruitment

- State partners and project staff agreed that challenges in Cohort 2 recruitment arose due to “last minute” planning, late requests for support from project staff, and a lack of clarity around roles in recruiting participants. State partners also indicated that teachers’ workload impacted recruitment.
- Some states incorporated the project recommended “bring a friend” strategy of recruitment in which Cohort 1 teachers invited a colleague to assist them in recruiting participants for Cohort 2.

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

Expectations for Teacher Participants

- Teachers thought the expectations for their participation was reasonable, and most did not feel obligated to implement all six units nor was it imperative to integrate all parts of every unit.
- Participants are invested in the ELM project and wanted to complete as many units as possible.
- Mathematics teachers participated in the project to gain well-developed materials and for the collaboration with fellow math teachers. Most ELA teachers were unaware of what the ELM project would entail but were encouraged by administrators, project staff, or peers to participate.
- Expectations are reasonable, per state partners, but first-year participants and teachers with multiple obligations may struggle to implement all units with fidelity.
- Partners thought that expanding the ELM project to a broader audience (i.e., teachers who may show less interest or engagement) may prove challenging.

Implementation

- Teachers varied in the number of modules they implemented with fidelity; ELA teachers tended to implement none, three or six modules and mathematics teachers implemented three, five, or six modules; and overall the most common was none, three or six. However, focus group participants tended to feel as though they were not expected or obligated to implement all six units or all components of the units.
- Teachers who struggled to implement any of the modules indicated that the content was too complicated, they lacked sufficient time to be comfortable with material, or the modules did not align with the state standards. Some teachers said they had other responsibilities or curriculum to prioritize above the modules.
- The Teacher Notes video was the least accessed resource, whereas the Student Activity, Instructional Activity, and Student Activity Handout were the most used materials.
- State partners expressed a desire for continuing to receive information on the project's progression toward project goals and outcomes, and how participation changes instruction.

Impact on Instructional Practice

- The ELM project had an impact on teachers' instructional practices by assisting them to personalize instruction and support struggling students. Specifically, teachers noted that ELM materials and learning maps provided more data to help personalize instruction for students, and they changed their use of questioning strategies to show student thinking, make decisions about individual students' needs, and understand how students think.
- Cohort 1 participants used the ELM materials and learning maps to adjust instructional practice to keep students moving towards their learning goals, provide students task-specific feedback that helps them fill in gaps in their knowledge, identify where students are in their

learning and what to learn next, help students reach their learning targets, and identify students' misconceptions.

- The summer training presentations increased teachers' understanding of formative assessment in addition to their methods to support students' self-efficacy and motivation.

Summer 2017 Training

- Cohort 2 and returning Cohort 1 survey respondents positively rated the facilitator quality, materials, and content of the summer 2017 training. Teachers also said the objectives were clear and accomplished; the training provided information and resources applicable to their professional practices; and the information was of high quality, relevance, and usefulness.
- When identifying the most helpful aspects of the training, teachers noted that they benefited from exploring and using the learning map software in addition to the support from speakers, ELM team, support staff, and the Cohort 1 panel.
- Most teacher participants reported that they felt comfortable and confident in using the learning map software and would like to use it frequently. Although many did not think they needed support from a technical person, a few teachers indicated that they needed to learn more before using the system.

Communication and Collaboration

- Most Cohort 1 teachers said they were pleased with the prompt response of ELM project staff and appreciated project staff's welcoming attitude and ability to make personal connections with them during the training.
- State partners said that ELM staff were supportive and receptive to ideas during the monthly meetings.
- Some state partners indicated that there were challenges in scheduling and conducting the monthly meetings, and they questioned whether other communication methods may be more efficient in light of the primary messages conveyed during the meetings.
- State partners appreciated the opportunity to connect and collaborate with other states, and indicated that teachers valued collaborating and networking with their peers as well.
- Partners also desired more one-on-one and group interactions with participating teachers (e.g., site visits and quarterly meetings).
- Generally, project staff believed there is a need for improved communication and collaboration amongst the ELM project team.

Recommendations

Based on the findings and conclusions, the following recommendations are provided for ELM project staff to consider in the project's third year of implementation. Similar to the conclusions, recommendations are organized by four areas: recruitment, expectations and

implementation; impact on instructional practice; summer 2017 training; and communication and collaboration.

Recruitment, Expectations and Implementation

Recruitment

- To improve recruitment efforts and buy-in, open the lines of communication to address stakeholders' questions and concerns around their involvement in recruiting and on-boarding as well as the project's intended outcomes.
- Provide participating teachers with specific talking points and responses to expected teacher reactions (e.g., "I do not have time to do this."). Consider providing one all-access account for the learning map software that participants can use for demonstration purposes.
- Clearly define the recruitment process to better inform stakeholders of their role in recruiting and on-boarding and provide an updated directory of project staff who can respond to questions during the process.

Expectations for Teacher Participants

- Clearly communicate the expectations for teacher participants (e.g., the number of instructional units to complete).
- Consider revising the expectations based on teachers' year of participation (e.g., reducing expectations for first-year participants during their first year of implementation and increasing expectations in their second year of implementation).

Implementation – ELM Materials

- Ensure that directions provided throughout the instructional units are clear and thorough.
- Consider providing a Microsoft Word version of the instructional units, and provide clear guidance on what can and cannot be manipulated, and in what ways. Design the instructional unit documents so that each section is bookmarked within the pdf or Word.
- Consider providing all materials for the ELA lessons (e.g., passages, stories) that a teacher will need to implement the lessons as this will decrease the burden on the teacher in needing to locate these materials.
- Consider providing a range of time estimations for the completion of a lesson; provide estimates based on low-level or high-level classes.
- Consider ways to better align the modules and resource content with state standards.

Implementation – Supports

- Explore ways to facilitate collaboration among all teacher participants, as well as among teachers within each state, district, and school. This includes during future summer trainings as well as during the school year.
- Continue to provide consistent and timely support via phone and email to participating teachers.

- Continue to utilize one email address for teachers to use for questions and feedback. This is helpful for both ELM project staff to have record of all communications and responses and for the teachers to have one contact.
- Consider providing a refresher webinar on using the learning maps and adding it to the ELM project website for reference for teachers wanting to review what was shown to them during the training to increase teachers' comfort with accessing and utilizing materials.
- Consider strategies to help teachers maximize time and align standards, modules, and other teaching responsibilities to implement materials with more ease.
- Explore ways to provide occasional “brown bag” or “question and answer” sessions on ways to use the learning map software.
- Consider requiring that there be at least two teachers from a district, to encourage collaboration. Further, explore ways to support district facilitation of periodic meetings for teacher participants from the same district.
- Continue to include school and district administrators in outreach and communication efforts.
- Provide teachers with their state partner contact information, along with information about their role and responsibilities, and the support they are expected to provide to teachers. Further, ensure that project staff and state partners' roles and responsibilities are clearly communicated to teachers.
- Consider ways to support teachers challenges in implementing the units (e.g., printing, navigating PDFs, and creatively adapting materials).
- Communicate the expectations for the number of units to implement with fidelity and/or offer support in assisting teachers to implement more units by overcoming time barriers, increasing comfort with material, and aligning material with standards.

Impact on Instructional Practice

- Share anecdotes and concrete examples with prospective teachers and school and district administrators of how the ELM project has influenced teachers' thinking about teaching and student learning, as well as ways they are using and implementing the lessons and the maps in their classrooms, and using formative assessment strategies.
- Continue to provide high-quality support that assists teachers in refining and enhancing their instructional practices, and offer additional assistance to teachers by need (e.g., communicating students' progress with parents, learning maps software refreshers).

Summer 2017 Training

- Continue to set aside dedicated time for both new and returning teachers to explore the software during the summer training, offering additional support to those who are not confident in their ability to utilize the system.
- Consider including presentation topics that address more advanced pedagogical theory/practice.
- If feasible, show recordings of Margaret Heritage's presentation(s) during future trainings.

- Consider arranging training agendas so that teacher could attend all presentations, not just those specific to their subject area.²

Communication and Collaboration

- Enhance the flow of communication among all stakeholders and consider integrating technology-based networking and continuing education opportunities for teachers. A directory with job descriptions would increase partners' knowledge in contacting the appropriate project staff.
- Bridge communication gaps to ensure stakeholders and participants receive the same information and further connect their involvement in the project implementation and plans.
- Provide clear guidance and expectations for state partners in recruiting new teachers and in supporting participating teachers.
- Consider utilizing a standing schedule (e.g., the first Tuesday of every month) for partner update calls. Assess the purpose and outcomes of meetings on an ongoing basis to determine whether other means of communication (e.g., email, newsletters, small-group meetings, etc.) could sufficiently replace monthly telephone meetings.
- Project leadership may want to consider how to address other project staff's (i.e., research/content and technology) concerns with lack of clarity on roles, responsibilities, and expectations. With some recent staff turnover and bringing on of new staff it will be important to ensure the work teams have a common vision, detailed project plan, and timeline to complete the tasks outlined in the proposal.

² Assuming there are presenters at each training next year.

Introduction

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), formerly The Center for Educational Testing and Evaluation (CETE), at the University of Kansas coordinates the project and it is administered by the Kansas State Department of Education. Additionally, there are three other state education agencies (SEA) collaborating in the project. Those SEAs include the Alaska Department of Education, Missouri Department of Education, and the Wisconsin Department of Public Instruction.³

The overall 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. During the 2016-17 school year, the 46 Cohort 1 participants trained in the first year implemented up to six instructional units (also referred to as modules) in ELA or math.⁴ The teacher participants provided feedback on the units, including all of the accompanying materials.⁵ ELM project staff made modifications, as appropriate, based on the feedback. This development and refinement process will continue through the duration of the project. Newly added were videos to accompany the teacher notes. Also, in development states and to be tested by participating teachers in Year 3 are locator tests. The intent of these brief pre- and posttests are for teachers to pinpoint where their students are with respect to the nodes and ascertain student learning following instruction.

In Spring 2017, SEA and ELM project staff recruited ELA and mathematics elementary teachers to participate in the project for the 2017-18 school year. A total of 57 teachers were invited to participate in Cohort 2 (21 ELA teachers and 36 mathematics teachers).⁶ In addition, 25 Cohort 1 teachers (11 ELA teachers and 14 mathematics teachers) opted to continue participating in the project.⁷ 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. The expectation is that following the training, the teachers will continue to explore the ELM online interface and its tools, implement those tools in instruction, and complete feedback surveys after each instructional unit. As with the previous year, ELM staff will provide ongoing support throughout the school year as teachers implement the ELM materials.

McREL International was hired as a third-party evaluator to gather data and report on the project's implementation and outcomes. This Year 2 evaluation report encompasses the time period

³ The Iowa Department of Education was originally a partner and discontinued participation in Spring 2017.

⁴ Not all six grade-level ELA modules were available for use in Year 2.

⁵ Terms used in this report include ELM products (i.e., learning map software, instructional units, and resources), and ELM materials (i.e., instructional units and resources)

⁶ For Cohort 2 ELA participants, ELM project staff focused on the recruitment of grades 2-5 as instructional units are available for this grade band. In Year 3, ELM project staff will develop a sufficient number of units for grades 6-8 and recruit teachers from those grade levels next year.

⁷ The ELM proposal identified a target of 50 Cohort 1 and 100 Cohort 2 teachers.

from October 2016 to September 2017 and focuses primarily on the project's implementation from the perspectives of the teacher participants, partners and project staff. Initial 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 concludes with conclusions and recommendations for ELM project staff to consider as they move forward with project implementation.

Methods and Analysis

Data Collection Methods

Several data collection methods were used to inform the findings presented in this report. Surveys were administered to Cohort 1 participants in spring 2017 and Cohort 1 and 2 participants attending the summer 2017 training. Cohort 1 participants continuing with the project participated in a focus group. Individual and group telephone interviews took place with state partners and project staff in summer 2017.

Cohort 1 Survey

An e-mail to complete an online survey was sent on May 1 to the 46 Cohort 1 participants. The survey is provided in Appendix A; open-ended responses are provided in Appendix B. The survey was available for a 4-week period and three e-mail follow-ups were extended for non-respondents. Thirty-one teachers responded for a response rate of 67%. Approximately half the respondents (52%) were ELA-focused and the other 48% were math-focused. Respondents represented all the participating states with more than one fourth from Missouri or Wisconsin (26%, respectively, see Table 1). Nearly half of the respondents taught fifth grade (48%) while approximately one fourth taught fourth grade (24%) (see Table 2).

Table 1. State Represented (n = 31)

State	Percentage
Alaska	9.7%
Iowa	19.4%
Kansas	19.4%
Missouri	25.8%
Wisconsin	25.8%

Note: Percentages may not add up to 100 due to rounding. The percentage of respondents by overall number participating was as follows: Alaska 60% (3/5), Iowa 60% (6/10), Kansas 60% (6/10), Missouri 73% (8/11), and Wisconsin 80% (8/10).

Table 2. Grade Level Currently Teaching (n = 31)

Grade Level	Percentage
Grade 2	12.9%
Grade 3	16.1%
Grade 4	22.6%
Grade 5	48.4%
Grade 6	12.9%
Grade 7	16.1%
Grade 8	12.9%
Other: Instructional Coach, High School Algebra I, Multi-grade K/1/2	12.9%

Note: Percentages do not add up to 100% as respondents had the option to select all grades that applied.

The survey included Likert-type scale items on ELM module administration, organization and administrator support, and use of maps and impact on instructional practice. There were several open-ended questions targeting use of ELM modules in instruction, changes in student learning, changes in understanding of formative assessment and changes in ability to provide personalized instruction.

Summer 2017 Training

At the end of the June training, a McREL evaluator administered an evaluation survey for the ELM project. The survey was completed by 78 of the 79 Cohort 1 and 2 teacher participants for a response rate of 99%.⁸ The survey is provided in Appendix C; open-ended responses are provided in Appendix D.

The 2017 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. The training evaluation portion of the survey consisted of 32 items in seven categories (e.g., facilitator quality; materials; practical and environmental issues; objectives; content; outcomes; and quality, relevance, and usefulness). The second part of the survey on the ELM system had 10 items. Both parts one and two had 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.

Cohort I Interviews

McREL led two 90-minute focus groups on June 22, 2017 with Cohort 1 participants continuing to participate in Year 2 of the project and attended the second year of training in Kansas City June 21-23, 2107. Two focus groups were held – one with the math-focused project teachers and the other with the English language arts (ELA) project teachers. Ten teachers participated in each focus group. The teachers were from Alaska, Iowa, Kansas, Missouri and Wisconsin. 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 six lines of inquiry:

1. Reasons participating in ELM project
2. Expectations for teacher participants
3. ELM materials
4. Supports
5. Challenges
6. Impact

⁸ All 57 Cohort 2 teachers and 22 of the 25 returning Cohort 1 teachers attended the training. Of those 79 participants, 32 were ELA teachers and 47 math teachers.

Partner Interviews

McREL held individual partner interviews in June and July with each of the primary contacts of the participating states.⁹ A total of four interviews were conducted either in person or by telephone; the average length was 31 minutes. 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 eight lines of inquiry:

1. Reasons state participated in ELM project and expectations
2. Expectations for teacher participants
3. Supports
4. Communication and collaboration
5. Satisfaction
6. Successes
7. Challenges
8. Reflections and recommendations

Project Staff Interviews

Individual and group telephone interviews were conducted by a McREL evaluator with ELM project staff in August and September 2017. A total of 12 staff members were invited to participate in an interview; all 12 accepted. Interviews were conducted between August 29 and September 6, 2017; the average length was 37 minutes. Eleven interviews were one-one-one and one interview was a small group interview with two people. Staff members represented project leadership/administration (n=4), research/content (n=5), and technology (n=3).

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 E.

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.

⁹ Three interviews were conducted during the training for Cohort 1 and 2 participants in June. The fourth interview was conducted by telephone in July.

Findings

The findings presented in this report are based on data gathered from interviews of the Cohort 1 participants, state partners and ELM project staff; Cohort 1 participant survey; end-of-training evaluation survey completed by Cohort 2 and returning Cohort 1 participants; and project documentation. Findings are organized by the primary evaluation areas: (1) expectations and implementation, (2) Cohort 1 impact on instructional practice, (3) Cohort 2 and returning Cohort 1 summer 2017 training, (4) successes and challenges, and (5) communication and collaboration.

Expectations and Implementation

Information gathered on expectations for participating in the project and implementation thus far were gathered from the perspectives of ELM project staff, state partners and the Cohort 1 participants. 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 to share their perceptions of how prepared teachers are to implement the instructional units during the 2017-18 school year, describe the supports project staff provide to teachers, and indicate any additional supports they believe would help teachers be successful in their implementation of the units. Lastly, project staff were asked for their suggestions on the recruitment and selection of the third cohort for the 2018-19 school year. Described in this section are staff's responses to these five areas.

Proposal Implementation Fidelity

All members of the ELM project team agreed that, overall, the project is being implemented as originally planned and proposed, though most noted various changes or adjustments made to certain activities. For instance, the development of the ELA instructional units began approximately one year after the start of the math instructional units, therefore project staff are currently focusing on completing the ELA units for grades 2-5 for use in Year 3 (i.e., the 2017-18 school year) and will then begin developing ELA units for grades 6-8 for use in Year 4 (i.e., the 2018-19 school year). Relatedly, staff focused their efforts on recruiting more grade 2-5 ELA teachers for Year 3. However, one staff member was concerned the team does not “have enough manpower” to complete the grade 6-8 units in time for Year 4. Regarding recruitment, staff also mentioned that with the withdrawal of Iowa from the project, they had to increase the number of Cohort 2 teachers they recruited from each of the remaining participating states to meet their goal of 100 teacher participants in Year 3.

Some staff also mentioned enhancements to certain proposed activities. For instance, work on the locator tools (referred to by some interviewees as the “pre- and post-tests”) was also

mentioned as a primary focus in recent months, and that staff are adjusting the tools based on teacher feedback and state partners to make them more “relevant and useful” in the classroom. Another enhancement includes additional strategies to support teacher communication and engagement using various media. Descriptions of these enhancements are provided in the Teacher Supports section below.

Teacher Preparation

All project staff who attended all or part of the June 2017 training agreed that, overall, the first and second cohort of teachers are prepared to implement the ELM instructional units. Indeed, some staff suggested that the teachers were better prepared than they were after the first training held in July 2016. Staff indicated that expectations were clearer and “more consistent” regarding unit implementation and the materials that were readily available to teachers. “[The training] this year was a lot more directed, a lot more specific,” commented one staff member, “The teachers were asking great questions. They weren’t asking the same types of questions as last year.” Staff provided more in-depth training on the use of the instructional units and the learning map software, locating units and resources, and allowing time for teacher discussion and collaboration on the use of the materials and learning map software. Staff also reported that, based on Cohort 1 feedback, they made efforts to address concerns about implementing the units with fidelity. As one staff member explained, “we talked about how they could customize the units to fit their time constraints or their curricular needs.” Another noted that teachers were shown ways to locate resources for other grade levels. In addition, some staff members said that the examples shared by Cohort 1 teachers on how they used the instructional units and the learning map software were helpful for all participating teachers.

Teacher Supports

When asked how teachers are supported in their implementation of the instructional units, project staff described several approaches that are currently in place. Staff reported that in Year 2, two webinars were held; the first was directed at school administrators to inform them of the project and gain their support and “understanding of the need for a little bit of flexibility on the part of the teacher.” The second webinar was aimed at participating teachers and provided updates to changes in the learning map software. Monthly newsletters providing project updates and teacher feedback are also provided to project participants. Teachers have opportunities to ask questions, call attention to technical issues with the learning map software, provide feedback on their use of the instructional units, and offer suggestions via email and phone, by completing feedback surveys, and via the learning map software. Staff reported that they respond as quickly as possible to teacher feedback. One staff member added that staff have also reached out to unresponsive teachers—in particular those who had not completed the feedback surveys. In addition, when teachers provide comments and recommendations about the learning map software in particular, this information “drives the future development of the [software] program. . . . A lot of our new features . . . are a direct result of suggestions from teachers.”

Several staff commented that an increase in more purposeful communication and collaboration between project staff and teachers, as well as among teachers, would enhance the

teacher experience. One staff member indicated that communication between project staff and teachers in particular was more reactionary in nature, stating, “[A]ny time they reached out to us, we were really quick to respond. But [we were] not necessarily being so active with setting up more frequent communication on our end. So, if the teachers needed something, they would ask.” Another staff member agreed, adding that certain staff took the lead in developing a more intentional plan for communicating with teachers:

[W]e didn’t really understand that it [communicating with teachers] was a priority. . . . [A]nd there was no vision for what should happen. . . . So, since there was really no coordinated plan, it just didn’t happen. And then this year, we figured out, well, if there’s going to be a plan, we’re the ones who are going to have to do it.

Staff also shared their thoughts on approaches that would provide more support to teachers and increase teacher engagement; suggestions included both unstructured and structured meetings:

[T]o check in with . . . teachers a little more frequently as a group would have been nice. . . . [A]nd in a less formal nature. Where there’s not necessarily something specific that we’re talking about, but just kind of a more general “What can we do? Are you coming across any challenges?” Things that may not come out in the feedback survey. Because at the training, I learned a lot that I wouldn’t have anticipated based on reading their feedback surveys. That made me realize that we had missed some things that were going on.

I think just maintaining more contact with them than we have in previous years. Classroom visits, just hosting more opportunities for them to collaborate, or sessions where they can ask us questions, or go through things. Because it’s really easy, when you’re teaching, to get lost in that, and get consumed with everyday life. And I think if we reach out to them a little bit more, we’ll get a good response.

[M]aybe more of a prescribed, just more of a laid out, “Here’s a review. Here’s what’s going on. Remember this.” Just kind of a recall and a cordial reminder of how things work.

I feel like the teachers that I heard [who] seemed most successful had other teachers that they could talk with about the resources. . . . I think some have to be more creative than others, in terms of how they work them [the instructional units] into their schedule. And so I think the ability to explain what we really want them to use and what they could modify so that we get the information we need, but they are able to actually implement it, I think would be a useful component. . . . And so they could express challenges that they’re facing and we could provide some ideas on how to overcome those.

Two staff members mentioned that stakeholder buy-in is a key factor in supporting participating teachers. One commented on the importance of having a strong presence and participation by state partners, but stated that “the state partners are completely disengaged.” The other staff member placed more emphasis at the building level, stating,

I think a big lesson learned from Iowa is making sure we are . . . reaching out to the people the teachers work for. Making sure the principals understand what's going on, [and] coaches . . . to [increase] community involvement so teachers aren't doing this by themselves.

Several staff indicated that efforts are underway to increase communication and collaboration with teachers. For instance, two webinars are planned for teachers as a “refresher” on how to use the learning map software and to answer questions; these webinars will be facilitated by project staff, but “the teachers are setting the agendas for what they want to talk to each other about,” added one staff member. Another indicated that an online “math chat” is planned each quarter for participating math teachers. A new discussion feature was also recently added that corresponds to the nodes and the resources in the learning map software, allowing teachers to chat with one another about their use of the software, ask questions, and share ideas and resources. Staff members also mentioned plans to visit participating teachers’ classrooms as another activity to further connect with teachers.

Teacher Recruitment

Project staff were also asked to share their thoughts and suggestions for the recruitment and selection of the third cohort of teachers. Several staff indicated that a recruitment plan should be established at the beginning of the 2017-18 school year so that recruitment efforts can commence as early as possible. Staff described their experiences with the Cohort 2 recruitment and selection activities as “last minute,” “delayed,” and a “mad rush.” They emphasized the need for a clear plan for reaching out to stakeholders, and that the plan’s development should be a collaborative effort among project staff, with clear expectations for project staff as well as state partners. One project staff member shared the goal of “relying heavily on our state partners to get the word out and attract the kind of representative audience they want.” As another staff member indicated, improved external communication would leverage the state partner’s regional connections:

I think [it is] making sure that our states are really up to speed on what everybody is doing. And keeping better contact with our state partners throughout the year, I think will give them more confidence in talking about it [the ELM project] at places that they are during the year. So, when it comes to recruiting, they have people they can go back to and tap.

“Everything needs to be more purposeful,” another staff member commented. Some also suggested some strategic approaches to recruitment; such as deepening the outreach within districts currently participating as “a proof of concept within a district” and recruiting from neighboring districts within each state as a means to increase teacher collaboration. One staff member suggested that “a lot of that decision making will have to do with the individual states and their state department of education.”

In addition, several staff suggested leveraging the experience and the collegial connections of the Cohort 1 and 2 teachers to recruit within their schools and districts. “I think we want to go a little bit towards more of the ‘bring a buddy approach,’” said one staff member. Another mentioned plans for staff to visit participating teachers’ schools as another way to answer prospective

participants' questions and generate interest in the project. Other suggestions included taking advantage of state and district conferences by setting up an information booth, offering an ELM training immediately before or after a local conference, and giving Cohort 1 teachers an opportunity to present and share their experiences with other teachers and administrators. Lastly, one staff member recommended providing participating teachers with the tools to "sell" the ELM project:

There were a lot of questions [from teachers] about, "How can we communicate this information?" I think that we could make a recruitment video using some of the footage from our training. Using some of the footage that we have of our software tool. . . . I think that might get more people excited than just saying, 'Hey, you should join this project. It's got this map, and these units.' . . . Just being personal about it and explaining how it would impact their classroom, I think would be helpful, and our current participants can do that.

Although project staff did not offer recommendations for criteria to select future recruited teachers, one staff member remarked on the valuable, untapped information teachers provided in their applications. "Some of it, we've not even used yet," this staff member explained, "Like comparing our applicant pool to our cohorts to see if we identified certain skills and actually capitalized on those in our cohort, [to get] a better picture of what are the characteristics of our cohort."

State Partners

In 2016-17, Cohort 1 teacher participants were expected to attend the summer trainings, implement six instructional units (also referred to as modules), and complete feedback surveys. In addition to providing ELM project staff with feedback for refining the modules, the goal is that participating teachers will improve their ability to provide personalized learning as a result of using the maps as a tool for formative assessment. The partners were asked whether such expectations were appropriate and about supports provided to Cohort 1 to aid in implementation. Described in this section are state partners' responses to those two areas.

Expectations for Teacher Participants

State partners generally thought expectations were reasonable. They mentioned some challenges, however, with teachers finding time to implement all six units, especially for those who have mandated curriculum. One state partner commented that she found it difficult to "overlay the maps" onto the state standards.

Two state partners commented that the teachers already participating were the "high-flyers" who readily took on extra work and were excited to try new things. They explained that, while the expectations might be reasonable for these teachers, they might not be reasonable for most teachers. For instance, one state partner was concerned about how the ELM project would support elementary teachers who "do not know math, do not like math. What will [teachers] do when they get these [mapping] progressions here and they will just look at it like it is a foreign language, and not know what to do with it?" This state partner also wondered how that would work practically,

asking, “Are you going to have to have remedial math for them before they even get into the advanced learning maps?” One state partner suggested that, ELM staff could reduce the requirements (i.e., only having to implement two units instead of six) to make the project expectations more attainable for first-year participants.

In addition to providing feedback on the expectations for teachers, state partners also commented on their expectations for themselves going into the project. One state partner hoped to aid districts in the transition to new standards through intensive collaboration in the ELM project that would then be scalable to the rest of the state. Several state partners expressed that they had expected to play a bigger role. One said, “Everything seemed to be happening between KU and the teachers, and the state partner really did not have much of a role.” However, one state partner said that the project had already exceeded her expectations, and she was happy to have had a more flexible role because her department was undergoing some “transitions” and appreciated that the project staff “were able to keep it moving in what [she] was not able to do as much.”

Supports

State partners had different perceptions of the supports provided by ELM project staff. For instance, one state partner appreciated that states were told they could be involved as much or as little as they wanted and that ELM staff would provide as much direct support as needed. This state partner commented that the project staff “were clear and they held up to what they said they were going to do for us.” However, other state partners felt left out by that dynamic. One state partner suggested that a different and/or more clearly delineated structure for communication between ELM, states, and teachers would be beneficial, while another framed this as wanting the “state department to be more of a support for the participating teachers.” Some state partners would like to be more actively involved with the teachers, including conducting site visits. Two state partners suggested that having some structured, technology-based networking and communication venues (e.g., webinars, email list serve) for teachers would be a helpful support to add. Two state partners mentioned that having assistance in establishing a system for participating teachers to receive continuing education credit would be a highly beneficial support that KU could offer. One state partner requested a directory of ELM staff and job descriptions to know who to contact with specific questions. These suggestions are discussed further in the recommendations section.

Cohort I Survey

In the survey administered to Cohort 1 teachers they were asked about the implementation of the ELM modules including the number of modules implemented and the specific materials that were used. The Cohort 1 teachers were also asked about supports received during the implementation phase and challenges encountered. Described below are findings related to those areas.

ELM Modules Implementation

Overall, ELA and mathematics teachers varied in the number of ELM modules they fully implemented in the 2016-2017 school year. Table 3 shows that, among all 31 respondents, teachers implemented none (23%), six (23%), or three (19%) of the modules. Of the 16 ELA teachers, 38% did not fully implement any of the modules, whereas 19% of teachers implemented three and six ELM modules, respectively. Most mathematics teachers ($n=15$) fully implemented six (27%), five (20%), or three (20%) modules. Teachers were asked via two open-ended survey items to explain reasons for which they were unable to implement any or more of the modules, respectively.

Table 3. Number of ELM Modules Fully Implemented ($n = 31$, n ELA = 16, n Math = 15)

Overall		ELA		Mathematics	
Number of Modules	Percentage	Number of Modules	Percentage	Number of Modules	Percentage
None	22.6%	None	37.5%	None	6.7%
1	9.7%	1	12.5%	1	6.7%
2	9.7%	2	6.3%	2	13.3%
3	19.4%	3	18.8%	3	20.0%
4	6.5%	4	6.3%	4	6.7%
5	9.7%	5	0.0%	5	20.0%
6	22.6%	6	18.8%	6	26.7%

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

Of those who selected *none*, one mathematics and six ELA teachers indicated that they were unable to fully implement any of modules due to different teaching assignments, the information was too overwhelming or complicated, the modules did not align with standards, and or additional support was needed. An ELA teacher commented, “I wish there was more support and communication available between participants. This would have helped me to feel more supported and would have also helped remind me to implement.” Other ELA teachers indicated they implemented pieces of the modules but there was “too much information” to fully implement. “I was overwhelmed, to say the least,” said one ELA respondent, “I was able to do parts of several of the modules, but they were really too big for me to implement fully.”

For survey respondents who indicated they had implemented between one to five ELM modules, teachers were asked to describe why they were unable to implement more of the modules. Similar to those who did not fully implement any modules, three mathematics and two ELA teachers experienced difficulty in fitting the modules into their existing curricula or requirements. A mathematics teacher offered the following explanation and plans for next year, stating,

I did not implement the Geometry 8.G.1-3 Distance-Preserving Transformations this school year because I was required to teach this unit in the same way that my colleagues were teaching the unit. However, I do plan to implement this module next school year and have talked to my colleagues to

determine that we can either all use the module or it will be ok for us to teach the unit/module using different resources but still administer the same summative/interim test.

Four mathematics teachers indicated there was insufficient time to explore the new material to comfortably understand and skillfully implement the modules due to other responsibilities. One mathematics teacher added that s/he was unsure which modules aligned with the standards already being utilized in lessons. Three ELA teachers indicated that not all modules were complete with lessons (e.g., 5.2RL, 5.8RI, 5.6RL); therefore, they could only implement the modules that were available for their grade level or content area. Other explanations offered by the survey respondents included prioritizing concepts or implementation strategies from other classes, acquiring a new position that restricted the use of ELM modules, and utilizing pieces from all six modules but only implementing two modules with full fidelity. One mathematics teacher completed five modules at the time of the survey but expected to complete the sixth by the end of the school year.

ELM Materials

There were a variety of ELM materials available to participants. Cohort 1 participants were asked the extent to which they utilized such materials and any challenges experienced in implementing the materials. Student Activity ($M=3.68$, $SD=0.57$), Instructional Activity ($M=3.61$, $SD=0.66$), and Student Activity Handout ($M=3.55$, $SD=0.67$) were among the most used materials, whereas the Enhanced Learning Map Document ($M=2.91$, $SD=0.75$) and Teacher Notes video ($M=1.64$, $SD=0.95$) were the least used materials. Teacher Notes provided a synopsis of relevant research with links to other materials, and the Teacher Notes video was introduced in January 2017. All ratings for survey respondents' use of materials are shown in Figure 1.

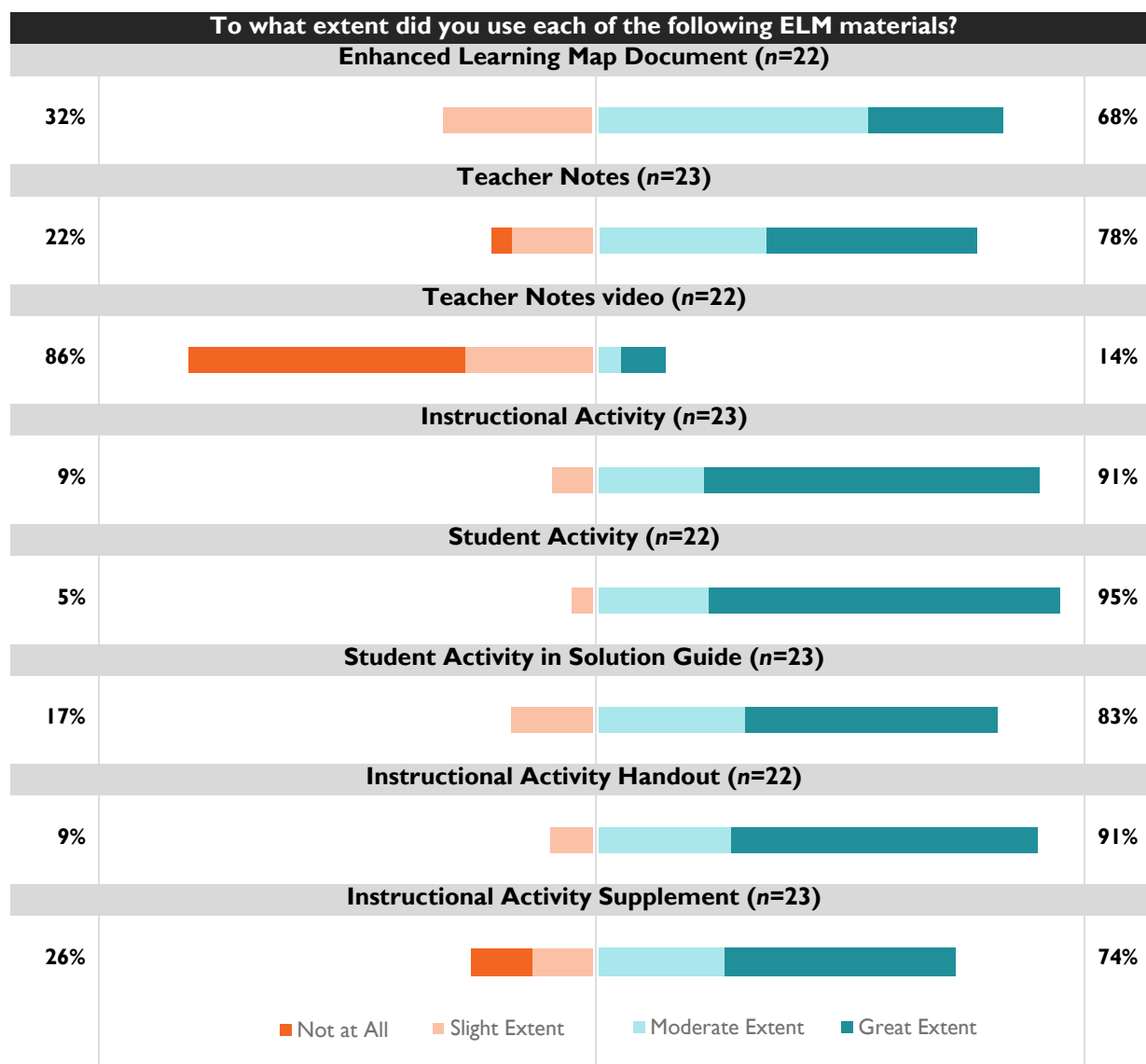


Figure 1. Use of Learning Maps in Instruction (n = 24)

A total of 14 teachers responded to the survey item related to challenges in implementing the ELM materials, though three teachers (two mathematics teachers and one ELA teacher) did not experience any challenges. Of the other 11 respondents, teachers noted challenges in locating materials, finding the necessary time, aligning materials with lessons, and gaining buy-in from teachers and administrators when using the ELM materials. Mathematics teachers tended to be the respondents who identified time as a challenge. Specifically, four mathematics teachers said they needed more time to become accustomed to using and or understanding the ELM materials. Both mathematics and ELA teachers struggled to find the correct materials based on content area or for certain lessons. Further, a mathematics teacher experienced challenges when reworking ELM lessons to ensure prior knowledge and other information were covered and in determining the best way to align the lessons and materials.

Supports and Challenges

Nearly all the survey respondents (97%) reported that their principal is aware of their involvement in the ELM project. Figure 2 displays teachers' responses related to the supports received. Most participants (79%) agreed that their principal supported their involvement in the ELM project and ELM project staff provided information and/or guidance to support their implementation of the ELM modules. Half of the survey respondents (50%) agreed that their principals provided opportunities to share information about the ELM project with their colleagues. Further, more than half of the teachers (56%) said that state or district contacts provided the information and/or guidance to support their implementation of the ELM modules, whereas 89% agreed that ELM project staff provided the same support.

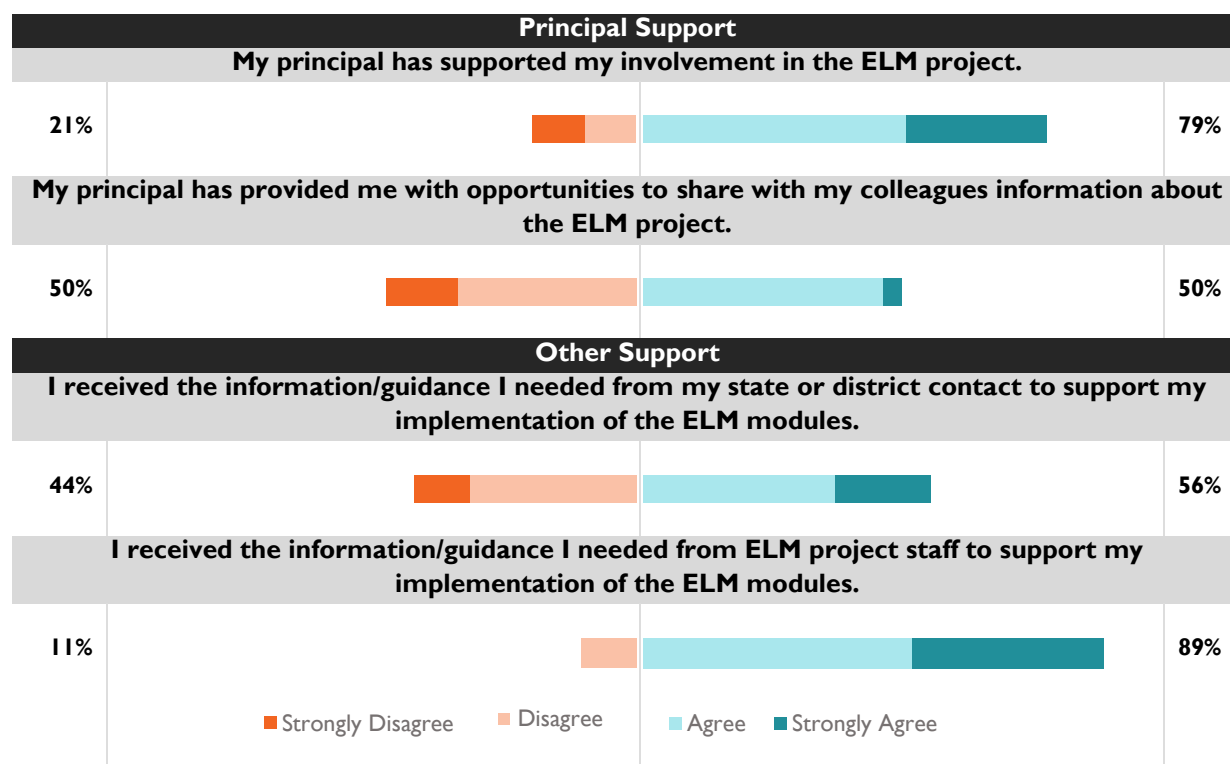


Figure 2. Organizational and Administrator Support (n=29)

Cohort I Focus Group

Reasons for Participating in ELM Project

The Cohort 1 teachers were asked what prompted their interest in the ELM project, and what they hoped to gain from the experience. Two distinct discussions developed among the math and ELA teacher focus groups. **In the math focus group, one primary interest for the teachers was having access to well-developed materials.** For instance, several teachers were interested in materials that could provide a comprehensive map covering several grades, which would, as one teacher commented, “help with differentiation.” A few teachers explained that there were a wide range of ability levels among students in their classrooms, and they were intrigued by the ways in which the maps would help to “fill in the gaps a little bit easier than trying to guess.” Another agreed, commenting, “I did feel like maybe they have already done the work for us.”

Collaborating with fellow math teachers was another draw for many in the group. As one teacher commented, “I really did not know what [the ELM project] was. It was just, for me, purely the collaboration part of it.” For some, it was the opportunity to attend the conference and work with their colleagues from the same school; for others, it was meeting and networking with teachers from other states:

It is nice to be collaborative, too, with people who are doing the same things we are doing, because we may have an idea, but when you talk to someone else about your idea and they add something to it, it makes it so much deeper and richer because you are using their input, too.

I welcome the opportunity to meet other teachers from different parts of the country and from my own state, too. That was a big incentive for me, just to be able to connect with other educators.

[T]he collaboration was a big piece for me, but the ultimate goal was to work with other teachers who are here this year . . . as long as you get one person on board then it starts to spread. If you are just by yourself, it is kind of tough to start out with that piece.

That is the nice thing, though, about being a part of this. There is a lot of seasoned, really higher level thinking people to go to. I have not thought about it that way, but if you use what I do and what you do and put it together it is pretty darn awesome.

The ELA teacher focus group's discussion also centered around their reasons for participating but, unlike math participants, they focused on colleague recommendations. Teachers indicated that they had received a general email about the opportunity, while others had received a personal invitation. Some reported being prompted by their principal or other administrator to attend the training; "I had three administrators say, 'You need to go see what this is,'" commented one teacher. Another was encouraged by a colleague who had signed up to participate. Most ELA teachers reportedly did not know what the ELM project was when they signed up but were open to the opportunity to expand their learning and engage in professional development. Some teachers indicated they were still unclear about the project even after having spent time learning about it, as evidenced by comments such as: "I went to the website and I did not feel like I learned anything more about it from the website at the time. I was still kind of in the dark," "I was on a fact-finding mission," and "We got here for the first day of training. We came back the second morning and we looked at each other, and I said, 'What did I sign up for?' No clue." Lastly, a few teachers appreciated that they were not required to commit themselves to completing the training; "I liked the fact that I could back out," commented one teacher, "I could try it and it was okay...so then I was willing to take the risk."

Expectations for Teacher Participants

Overall, teachers agreed that what was expected of them as project participants was reasonable and was not burdensome. One theme that emerged was that **teachers felt no sense of obligation to implement all six units, nor did they feel it was imperative that they used all parts of the unit.**¹⁰ One teacher commented that if project staff had told teachers to implement all six instructional units "or do not bother, then I think it would have been unreasonable. But to say 'Up to six,' made me feel...I could actually do it." Others agreed; "I never felt pressure that I had to

¹⁰ It appears there was a change in ELM project staff messaging with regard to this expectation. During the 2016 training, the importance of implementing all six instructional units (or number available) in their entirety was communicated. It is critical to implement the units with fidelity in order to fully answer the research questions specified in the proposal.

try wholeheartedly every single thing [in a unit].” Several also agreed that they would have been much less likely to remain in the project if the expectations had been more stringent and if the project staff had not been as supportive, as explained by one teacher,

You were not obligated, and you could do none. There are some teachers that did not do any, and they [project staff] were okay with it but they still checked in with you and said, “Hey, I did not see that you did any. Is there anything that we can do to help or anything like that?” I did not think it was unreasonable because of how they worded it. If they would have said six, I would have been like, “Look, see you later.”

A second theme that emerged was that **teachers feel invested in the ELM project and, therefore, felt a responsibility to complete as many units as possible.** One teacher “felt obligated” to implement the units, although another felt differently, stating, “I put more time into it than \$200, and I chose to do it.” Further, one teacher, who had expressed a lack of confidence in using the learning map software during the school year, used his/her time to delve deeply into the units and use it as part of the curriculum, noting,

A lot of teachers have been complaining that they had no time, and that their districts are very strict on curriculum. . . . I lucked out, because I had time in my schedule, forty-five minutes a day, to do these . . . but it was my curriculum for that time.

Another teacher agreed that, despite the length of the units, time was not a barrier:

There is a lot in each lesson, but I think that is going to be true of anywhere I go for resources. . . . I do not feel like I spent that much more time on their lessons than I would have doing other [lessons].

Additionally, **a few teachers believed that the expectations for the second year of implementation are more reasonable,** as one teacher commented, “I have had a year to figure it out . . . I am better prepared to [implement units] this year than I was last year.”

ELM Materials

When asked if the ELM materials were easy to use and teacher friendly, overall, **teachers found the content to be teacher friendly.** The Teacher Notes in particular were mentioned by teachers in both groups as being helpful. “I learned quite a lot [from the Teacher Notes],” commented one teacher; another saw their value in grounding the unit in a focused way, noting, “They were really in detail, and it really brought out the whole unit itself, which is really important to have.” However, some teachers also found them to be lengthy and often did not have the time to read them thoroughly. The Guiding Questions were another valuable resource for teachers; however, they agreed that having some examples of anticipated student responses would be helpful, particularly for new teachers or those teaching a new grade level.

Some teachers in the **ELA focus group also found that implementing the lessons took more time and resources than they had anticipated.** Others found some ambiguity in the directions. For instance, teachers commented that the time estimates provided in the materials were

underestimated. “It would say,” remarked one teacher, “‘This should take you 45 minutes.’ As I get into it, and my kids were a whole grade level behind in this, and I did not know. Is that for a Title I school in Alaska, and everyone else is right here? It is hard to know.” Another reported having to do “a little pre-teaching” prior to giving a lesson. One teacher gave an example of directions that read, “Find a story or passage.” “Well,” asked the teacher, “how many pages? Should it be something we already read?” Lastly, a suggestion made by one teacher was to connect the resources to each of the standards; in other words, “mapping the resources as well and the standard.”

Supports and Challenges

Supports related to implementing the ELM modules and using the learning map software were categorized into three types: summer 2016 training, ELM project staff supports and other supports. Teacher participants’ responses to each of those areas are described below. Additionally, the challenges mentioned by the participants are also included in this section.

Summer Training

Teachers in both groups spoke of the successes and the challenges of the first ELM Teacher Training in 2016. Most teachers agreed that, **after the training, they did not feel fully prepared to implement the modules in their classrooms.** “I needed more guided practice in the summer,” noted one teacher, who continued, saying, “I did not feel prepared to use the maps and I did not have time to figure it out on my own. Another agreed, stating, “I left [the training] knowing what [the Enhanced Learning Maps] were, but still feeling very unprepared for how I was going to use it and implement it.... [I]t just still felt very overwhelming.” However, one teacher, who has a computer science background, disagreed, and found the software “extremely user-friendly.”

The **primary reason teachers felt unprepared was that the ELM software had not been fully developed, which led to “trial and error and frustration.”** “I think [the 2016 training] was a nice overview,” commented one teacher, “but there was not enough created yet.” One teacher described the training as “rushed,” and another respondent mentioned technical challenges that restricted the number of teachers who could access the system at the same time. Further, several of the ELA teachers expressed frustration that not all maps were available and ready for use during the school year, as explained by one teacher:

That was the frustration last year . . . they [project staff] were like, “Explore the map, find your grade level,” and so we click on fifth grade, and there is nothing there specifically for fifth grade. And . . . I thought they had said, “More will be coming, so do not worry about it,” . . . and there was nothing all year there.

One teacher responded by describing how he/she moved forward independently in using the software to address students’ gaps in learning:

[T]here was nothing in [grades] 1 and 2 . . . I just thought, “Okay, I do not know . . . how to work it, if I am working it right or wrong,” and I just did it myself. I went back and I used the

standards and the nodes to see where the children were missing and just made it my own and printed it out and just ran. . . . So for me, the nodes are the only thing I use.

Several **teachers commended the staff for the project improvements that have been made since the 2016 training.** For instance, some teachers reported they had given feedback last year about the need for more time to explore the learning map software, and appreciated the additional time built into the 2017 agenda for this purpose. Others acknowledged that during the 2016 training project staff were “transparent” about the fact that the software was still in the developmental phase. Teachers also expressed appreciation for project staff’s intentionality when making adjustments and improvements to the software based on teachers’ feedback:

[T]hrough the whole year I feel like—and now coming back to this [training]— they listened to us. I mean there are things that have changed. . . . Even though I felt like, I am not positive how I am going to use this, I never felt like . . . I am never going to learn how, because it was one and done and they are set with this is how it is. Good luck. And we have all walked away from trainings where we felt like they said, “Good luck.”

Cohort two said, “How was it this year? Was it the same way as last year?” And I said, “Oh, way better.” Like you got in to explore . . . just to see what is in there, because you do not have time at the end of the summer.

Teachers also shared feedback on the presenters selected for the trainings. **The ELA focus group was particularly impressed with Margaret Heritage’s presentations both in 2016 and 2017, and found her to be particularly impactful.** Teacher described her presentations as “grounding,” “wonderful,” having a “huge impact,” and “worth every penny.” Several in the ELA focus group also spoke about the presentations by Lori Winters and Bruce Frey. One teacher felt “like I was back in college.” Another commented:

I think the quality was so different that we need to make sure, if we are bringing us together, to raise our knowledge, let us find somebody that is the same level as they [math] had, and it was not. . . . I do not think we all learned a whole ton of new stuff. We did not have a name presenter as they did in math, so I felt like it was a little bit gyped.

However, further discussion among ELA focus group members revealed differing perceptions of the value of Winters’ presentation. Other teachers appreciated Winters’ discussion on methods of integrating technology and ELM materials into existing lessons:

I appreciated . . . seeing how the teacher had used the existing program from the district, because that is what I struggled with this year with the Enhanced Learning Maps, is because I was trying to implement a brand-new reading program for the first time this year and trying to do that with Enhanced Learning Maps this year was just too much. Looking at how she had used those materials, and maybe not with the fidelity that the district wants you to, but I think that that is something I can work towards in my own building.

Teachers in the math focus group shared their impressions of Karen Karp's presentation, describing it as "amazing," "awesome," and "outgoing." That a nationally known math expert was selected to present did not go unnoticed; as one teacher said,

[I]t does make a difference. . . . We do not need to hear the same stuff we have heard for years. It is nice when you have somebody who is at a higher level, that they take time to bring them in.

Lastly, one teacher in the ELA focus group expressed a desire for the opportunity to attend both math- and ELA-focused presentations, because "those at the elementary level, most of us teach both."

ELM Project Staff Support

Teachers reported an inconsistency in supports provided by project staff throughout the school year. For some, responses to feedback or questions were delayed; one teacher indicated at times he/she did not receive a response to a question or comment until two months later; another indicated that their district's ELM group facilitator would email questions to project staff and would still not have a response by the next meeting (however, this teacher acknowledged that because it was handled by the facilitator, he/she could not be certain what had been communicated, or when). However, for many teachers, the response from project staff was very prompt; "They are there in a nanosecond. I think they are just kind of waiting for somebody to ask them a question." "It was like, boom," remarked another teacher, "they listened and they were like, 'Oh, those are some really great ideas.' . . . They are not only listening to our ideas, but they are also applying those ideas and getting that feedback." As explained by one teacher, having just-in-time support from project staff also gave teachers a sense of ownership and connection to the project:

[T]hey were always checking in to make sure you were getting it, so you never felt like, "Oh, I am on an island and we are just a project that they wanted to do." That has always been nice because you felt that connection. Sometimes when you do research you do not feel that connection. You are just kind of there, but to have that connection is so important. It makes you feel like you really do mean something and you really are valued.

Several also **expressed their appreciation for how project staff made them feel welcomed and proactively made personal connections with them during the 2017 training**, remarking that project staff knew their names without having to ask. "It makes you feel like they care enough, so you want to give just that little bit more." In addition, **teachers agreed it was helpful having one email address to send questions, comments, or other information**, which avoided their having to "worry about which person I needed to send it to." Lastly, a few agreed that participants would benefit from opportunities for collegial sessions; one said it would be "interesting or maybe even a little bit helpful if we had maybe a check-in with ELM [project staff] . . . they talked about Google hangouts and Facebook pages. . . I waited for those things to come so we can work together."

Other Supports

Overall, responses were similar when teachers were asked about other types of support they received during the school year. **Several teachers reported that their principal was generally aware of their participation in the ELM project, but was not well-informed about the project itself, and therefore was unable to provide meaningful support.** “My principal really did not know what I was doing,” explained one teacher, “not that he was not supportive . . . he just was not really involved.” For another, not having enough time in the first training to explore the maps impacted his/her ability to “explain it in great detail, and the video that they had on the website was also not as extravagant on explaining it too.” Further, several teachers remarked that, when their principal learned of their participation in the ELM project, their response was, “have fun.” Similarly, several teachers reported having no contact or support from their district.

Most teachers also reported having little contact and support from their state contacts. Indeed, teachers indicated they did not know who their state contact was, what their role on the project, what they could contact them about, or did not receive prompt responses from the state partner when they did reach out. “I did not go to my state contact,” commented one participant, “I went to these people [project staff] because they seemed to respond better.” Further, some teachers expressed a sense of isolation as a participant in the project, and were eager to leverage their connections and collaborations with other participants as a way to gain momentum and be successful in their implementation:

I am the only person from my district. . . . [T]here are more of us this year as far as the state, but, again, from my district, I am still the only one, which I am okay with and I still feel like I could spread that at least to my school given the opportunity. But I am not really getting any support at any of those levels to do so. It is very much an island this year, which maybe is why I am so attached to the collaboration part of it.

I am so excited because there is now one other person from my district, not from my building, but from my district, who is involved now. There is someone I can talk to, finally.

I think the difference in implementing it is going to be that you have enough [participating teachers] at your school or your district that can get together and work as a group to make this happen. . . . [A]ll these people have different ideas of how we can make this work together, and I think that is what is what is going to drive it.

The exception to this theme were the teachers from Iowa, who reported having monthly meetings as a group with the professional development coordinator hired by the district to facilitate implementation, along with the state partner. “That was really helpful,” noted one teacher, “because we are from the same district but not from the same building.”

Challenges

Four primary themes emerged regarding the challenges teachers experienced when implementing the instructional units in their classrooms. **One point of discussion for both groups**

focused on the usability of the instructional units and the challenges of working with the units as they were designed. For instance, the length of each unit, which is provided as one Adobe Portable Document Format (PDF), proved to be too long for some teachers. “There goes my printing budget,” commented one teacher. Another teacher added that it was difficult to determine the specific pages to print; others suggested placing the student handouts at the end of the document, or creating bookmarks within the PDF for easier navigation and printing. Several expressed a desire for more flexibility in using the instructional units in the classroom to facilitate quicker responses to students’ needs or to make it more grade-level appropriate. **Teachers acknowledged that using the materials as presented is important for the fidelity of the project research, but still wanted freedom to manipulate the materials:**

I was not changing it [the instructional unit] because it was not good. . . . [Y]ou know how stuff comes up and you are like, “Oh, that is not where I meant to go, but if you [the students] are taking me there I am going to take you on that ride, and then we will come back around and pick up where we left off.” It did not give you that flexibility to change gears with the kids when they wanted to change gears.

[I]t would have just been nice if they [project staff] said, “Okay, do not alter this,” but maybe, like when we do with our maps, we save it [an instructional unit] as our own to do something with it so that we could alter it in some way. I understand they want the integrity of the activity to remain the same, but as teachers . . . when something does not work, I go in and I want to adjust it at that time so I can make it fit my kids or my learning better.

[I]t would be nice if we could just do some editing without losing integrity for what they are doing. I am not trying to change it. I just need to make it usable. . . . I did not need to edit the teacher side of it. I needed to be able to manipulate the student resource part.

[For] the student resources, either [incorporate] flexibility to change it up a little bit or [make it] a little bit more student friendly, especially those younger grade resources. It does not have to have butterflies and flowers on it to be elementary school . . . but they are used to . . . some pictures, some graphics. A little bit bigger font. . . . And that does not necessarily add or take away from the math itself, but it is part of what we do in elementary land.

A few teachers mentioned the “time-consuming” task of retyping some of the materials to meet their needs. Further, some teachers said it was “cumbersome” to use the PDFs with their existing classroom technology, such as smartboards.

I want to show it in a different way and I want to be able to touch it . . . there is such a push, and for good reason, with the technology and blended learning and all the things that we are doing that personalize it. . . . I mean there was even a question on the feedback surveys about technology and I am like . . . what do you mean by technology?

A second challenge revealed in the discussions was that some teachers who explored and used the learning map software during the school year were overwhelmed by the magnitude of the software. One teacher said, “I found the nodes to be really hard to use.

Whenever I went down and tried to find things . . . I would have three that would help me and then suddenly I had 400.” Navigating the nodes and saving specific maps also proved to be difficult, as one teacher commented, “I could not figure out how to get back to where I had the node that I started with, so I would have to start again. . . . I did not give it to the kids because I was still trying to figure out how to print and save and keep what I wanted.”

A third challenge for some teachers was their inability to communicate to colleagues and their principal about the ELM project, and to fully describe how the ELM learning map software is different from other educational learning map software. One teacher noted, “the fact that nobody else can access the maps except us . . . makes it hard to share . . . [with] the community.” Teachers also described the resistance they have observed or that they anticipate among their colleagues:

It was very difficult for me to communicate this to other people. Then when I tried, they did not want to even listen because they thought it was just boring. Then I had a lot of people say, “All right, then. I have done that educational mapping stuff before.” . . . I said, “But this is different.” I even tried to show it at an in-service and everybody was just like, turned green . . . because it is difficult. It is very overwhelming, and about 98 percent of the teachers said, “I do not have time for that.”

The teachers I worked with last year really are not interested unless it is ready from the printer for a teacher’s use. . . . [I]f it is really going to take that much work to prepare things, or take a lot of time, they really were not interested. . . . I think the teachers will be more open to my experiences with this, but I am not sure that anyone is going to be interested enough to say, “Hey, I want to jump on board.”

A final challenge was that some teachers were unable to implement all six instructional units in their classrooms. For instance, one teacher reported only using instructional units which aligned with the lessons he/she had planned for the year. Another teacher indicated that there was little time to implement other materials, as there was “no math intervention time” built into the schedule and teachers were expected to implement the curriculum with “total fidelity.” Lastly, a few teachers reported not implementing units for which there were no materials available.

Future Participation and Implementation

Finally, though not specifically asked, teachers also shared their hopes and concerns for the future of the project. Some teachers expressed interest in supporting outreach and recruitment efforts within their own state, and maintaining the collaborative spirit of the cohort model. Others shared their concerns about the implications of making the ELM products available as an open resource without a strategic plan for promoting its features or having additional supports (e.g., training) available to users.

[N]ext year I know they are coming to the individual states. . . . [A]re they going to invite more state people like superintendents or principals to get the word out? Is that their plan? I do not think anybody has really communicated that. It would be interesting to know how they are, what the master plan is.

... How can we support that? Could you invite some key people from different parts of the state if we all live in pretty big states and then have a plan then after that to spread it out?

Especially as cohort one. ... I would love to help them make that [scale-up] successful in five different states, and then, after that, how do we get back together? ... [E]ven if it is not physically face-to-face, pull those five back together, because that is a pretty amazing resource.

I am concerned for the future of the maps, because obviously we have had six, seven days of training now, and we know how it works. We are excited, but just putting a link on the Department of Education's website saying, "All right. It is free for you to use." It is not going to be used, even though it is really good.

They are going have to create some trainings for teachers before they release it, because anything like that, if you just put it on the website, it is going to just sit there. ... You are going to have to show how you use it.

I think we are going to have to somehow tie it to the state assessment pretty closely for our principals and our districts to look at it. ... It has got to be data and you are going to have to show that it made a difference and then you will get a principal or a district to grab on.

Cohort I Impact on Instructional Practice

In both the focus groups and spring 2017 survey, cohort 1 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.

Cohort I Survey

Cohort 1 teachers were asked via a participant survey to discuss their uses of ELM (survey references to ELM includes both the learning maps and the ELM materials) and the subsequent impact on their instructional practice. Survey respondents indicated that the learning maps were used in creating individual paths, identifying and remedying learning gaps, and detecting requisite skills. Mathematics teachers used ELM materials for lesson planning and instructional implementation purposes. ELA and mathematics teachers alike also used ELM materials to supplement their curriculum.

ELA and mathematics teachers reportedly used the learning maps to create individual learning paths for students. An ELA teacher added that ELM was used as a guide to assist teacher aides in working with students, whereas the other ELA teacher spoke to parents about students' learning gaps with the support of the learning maps. One mathematics teacher took notes on students' needs to measure their initial knowledge and set individual goals. Two mathematics teachers who used the learning maps for individual planning allowed students to document their progression of units by highlighting the nodes in which they felt proficient or encouraged students to use maps to identify next steps for their learning.

Survey respondents also used the learning maps to identify students' learning gaps and implement activities or learning paths to address students' needs. An ELA teacher added that student activities in the ELM modules were helpful but were too lengthy to practically implement in the 30-minute class period. Mathematics teachers used the ELM materials to guide questioning and teaching strategies, pinpoint students' misconceptions, reteach or review the appropriate content, and set a path for students to obtain the necessary skills or knowledge.

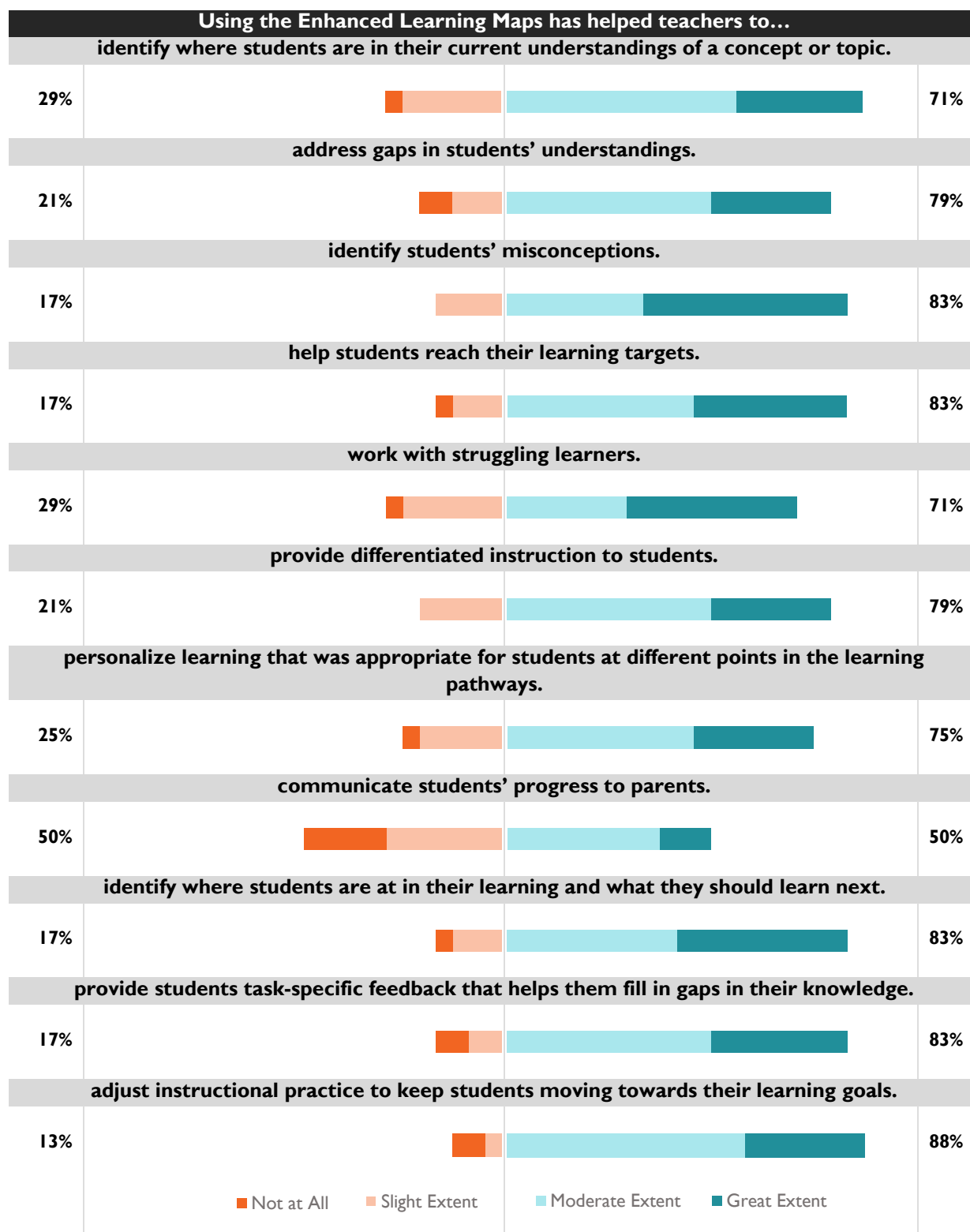
Six mathematics teachers discussed specific ELM materials used for planning and implementing lessons. They used instructional activities (e.g., fractions learning, Piggy Bank Activity), student examples, teacher guiding questions, teacher notes, and units to teach specific content (e.g., lesson on volume). One mathematics teacher added, "I have implemented the Instructional Activities and found that, after reading the Teacher Notes and implementing the Activities, students seemed to have a better understanding of the learning targets compared to how I previously taught the modules using the text book resources."

ELA and mathematics teachers identified requisite skills (e.g., adding and subtracting fractions) to ensure students have the background knowledge needed to be successful and display students' progress. Other teachers used ELM materials (e.g., instructional units, student activities guide) to supplement preexisting lessons, often teaching a lesson then using the ELM materials to provide depth to the lessons. Further, one ELA and one mathematics teacher used curriculum mapping to present material in different ways based on students' needs and create a cohesive plan to teach standards for multiple grade levels, respectively.

Other teachers used the ELM materials for interventions and whole-class instruction and required students to provide evidence of proficiency in their portfolios. One ELA teacher stated,

I have used [ELM materials] for my teacher assistant[s] to use as a guide as work with the students. I have used it to reteach something that I have not communicated well to the group, when the students seem lost or confused I use it to back up to their understanding level and then proceed from there till they comprehend the new information they are learning. I have used it to teach from, the six [modules] were not enough so I have made up my own based on the map and the nodes. I have reinvented it to fit into my teaching year even though it is not completed like that, I found that it could be used to enhance my students learning...I just had to make it useful for me. I made it my own.

Figure 3 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 keep students moving toward learning goals (88%), identify students' misconceptions (83%), help students reach learning targets (83%), provide students with task-specific feedback that helps them fill in knowledge gaps (83%), and identify students level of knowledge and establish next steps (83%). The least common practice of using the maps was to communicate students' progress with parents, though half of the respondents (50%) agreed they had used the maps for this purpose.



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

Figure 3. ELM Usage

Impact of Learning Maps on Instructional Practice

Survey respondents also indicated the extent to which the use of the learning maps impacted their instructional practices, as shown in Figure 4. Most teachers indicated that learning maps provided more data to provide personalized instruction for students (83%). Many teachers noted changes in their use of questioning strategies to elicit evidence of student thinking (83%), ability to make decisions about individual students' needs (75%), and in their understanding of how students think (71%).

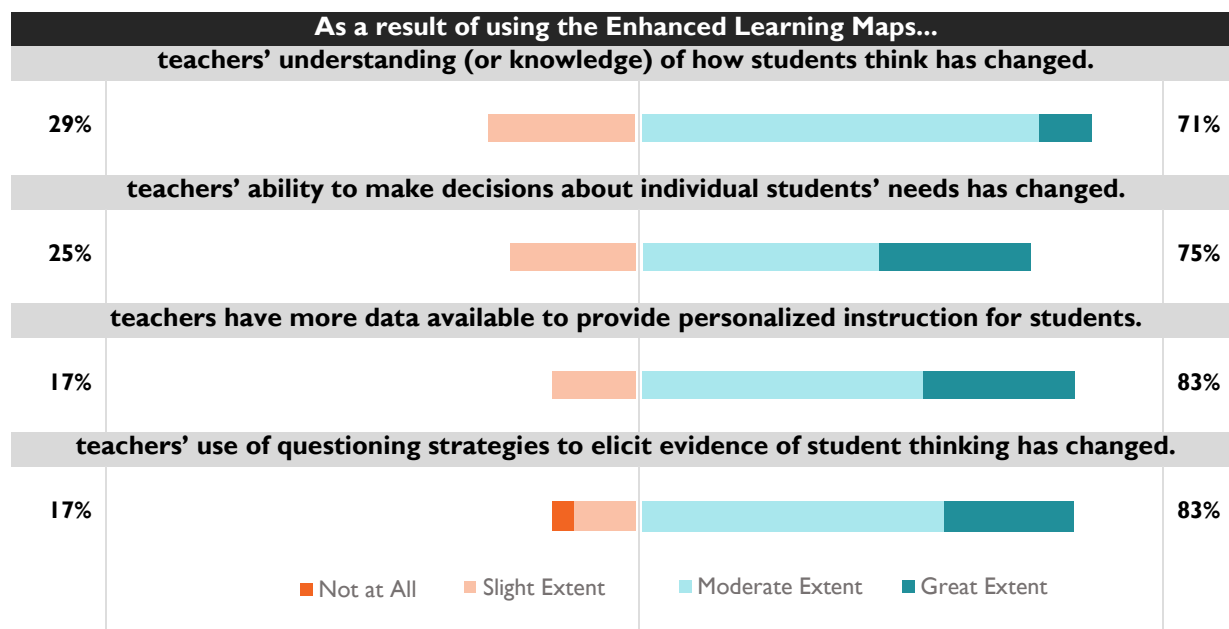


Figure 4. Impact of Learning Maps on Instructional Practice

Changes in Student Learning

Teachers were also asked to discuss the changes they observed in student learning as a result of using the ELM materials and learning maps along with specific examples. Some survey respondents noted signs of higher engagement and better comprehension among students. One ELA teacher reported, “Students liked the feeling of ownership the learning maps afforded them and, as a result, I felt they gave better effort.” Another ELA survey respondent added that the ELM materials excited students while promoting critical thinking and questioning for enhanced understanding. Mathematics teachers concurred that students asked more questions, took ownership of their learning, and felt more confident in the classroom. Other mathematics survey respondents indicated that the ELM materials increased students’ motivation to learn by allowing choice and different solution strategies. As an example, one mathematics teacher stated,

Students really enjoyed the geometry unit. The questions were great...also I coupled it with using GeoGebra to create a project of stained glass and ...the kids were so excited. I heard comments like...” I hate geometry, but I like this.” “Can we do this all the time?” “Oh wow, we can blog the answers to these questions!”

Of those who indicated that the ELM materials and learning maps increased students' understanding, most survey respondents (86%) were mathematics teachers. One ELA teacher stated that students, in general, had a better understanding of the lesson. Mathematics teachers agreed, stating that students were more motivated to learn due to the structure of lessons (e.g., hands-on activities) and context of learning, while one teacher felt more confident in the strength of the instruction itself to enhance student understanding. One mathematics teacher shared,

I noticed huge changes in the volume unit results. Students had a better foundational understanding of volume than they have in past years. I also noticed the division activity pages focused on fact families and interpreting various aspects of the division word problem. In the past I have skipped over these skills but I was reminded of the importance of addressing the underpinnings in this manner.

Another mathematics teacher added,

I have seen the students feel more confident in their understanding, more able to ask questions to get clarity, more in control of their learning. The parents are involved and can understand exactly what to help their child with. There is less of an invisible wall between school and home. It has broken it down into understandable chunks for my students and my teacher assistants. The students' retention is greater and they can transfer their learning into other areas making learning meaningful.

Four teachers (three mathematics and one ELA) added that the learning maps assisted them in planning instruction and identifying gaps in students' knowledge. One mathematics teacher specified that the ELM materials have helped participants "create a more systematic approach to identifying gaps and grouping students for review/re-teaching based on similar misconceptions and misunderstandings" while another concurred that student explanations for problem solving have assisted in identifying challenges to their learning. An ELA teacher added that, given high student absence rates, the ELM material have been a "great tool" in reviewing and retouching content to ensure all students are provided an opportunity to learn.

Other survey respondents identified additional evidence of changes in students' learning, including more student responsibility for their own learning, acquisition of new skills to expand critical thinking, and method to check student progress toward learning goals.

Provision of Personalized Learning

Survey respondents spoke to the ways in which the ELM materials and learning maps have changed their ability to provide personalized instruction. ELA and mathematics teachers indicated that they were better able to help struggling students and the activities and multiple approaches available through the ELM materials were useful in personalizing instruction.

Five teachers (one ELA and four mathematics) said they better equipped to help struggling students by identifying gaps in their learning and creating lessons that align with their needs. "I feel that the units helped me to identify strengths and weaknesses in my students," stated one mathematics teacher, "It has also helped me to better understand where my students are struggling and what I can do to help them be more successful." Other teachers added that they were able to

use the maps during informal assessments or revisit modules before teaching a lesson to enrich students' comprehension.

Some teachers indicated that the learning maps were a useful tool for personalized instruction ($n=5$). Many of these respondents implemented personalized instruction prior to project participation; however, the learning map software “brought a new dimension to the table” to make the process easier. An ELA teacher reported,

I found that this tool has been a great asset to my teaching because it goes across grade levels and goes directly to the “what is missing” so I can include that in my instruction for every student. This has been a great opportunity to use in the multi-grade level situation that I am currently teaching, and the remote isolated location my school is located in. The students miss school, families have harsh lives, and limited resources available to them. This has been dramatically effective in keeping my students engaged, and being able to understand the concepts better because no one is left out anymore.

Further, some teachers said the learning maps provided a guide for personalized instruction, assisted in identifying students' skill levels, or informed the alignment to each component of the standards. Overall, participants reported that they have the necessary materials available and the ELM materials and learning maps supported their prior knowledge to better support students.

Understanding of Formative Assessment

Survey respondents were also asked to discuss any changes to their understanding of formative assessment. Many teachers indicated that their use of formative assessment changed, and some teachers said participating in the ELM project clarified the purpose or use of formative assessment.

ELA and mathematics teachers (four respondents, respectively) described ways in which their use of formative assessment changed. Survey respondents reportedly gained new strategies to inform their lesson planning and differentiated instruction and increased the amount or frequency at which formative assessments were used. Some teachers said the project enhanced the way they frame questions and identify students' skills aside from those directly assessed. The three teachers who indicated that the training clarified the purpose of formative assessment learned the importance of using multiple formats to understand students' comprehension, filling in gaps in knowledge rather than re-teaching entire lessons, and implementing formative assessment through the unit to check for understanding.

Six participants (two ELA and four mathematics) reported that their understanding of formative assessment did not change as they already had prior knowledge. These survey respondents stated that formative assessment has been a routine throughout their daily instruction and they were knowledgeable prior to their participation. Some teachers indicated that the ELM training confirmed their understanding of formative assessment, with one teacher adding that more materials are available and another teacher gained understanding for interim and summative assessments.

Mathematics Skills and Confidence

Mathematics teachers were asked via the survey to rate their skill and confidence levels in eight areas of instruction. All 14 respondents (100%) felt moderately confident in their ability to choose and use definitions and representations. Further, all mathematics teachers (100%) rated their skill as moderate for analyzing students' errors in mathematics tasks, facilitating mathematical discourse, giving and evaluating explanations, and interpreting and responding to students' ideas. The mathematics teachers were less likely to report confidence (58%) and skill (67%) in examining correspondences among representations and solutions. Confidence and skill ratings for all eight areas of mathematics instruction are shown in Figure 5.

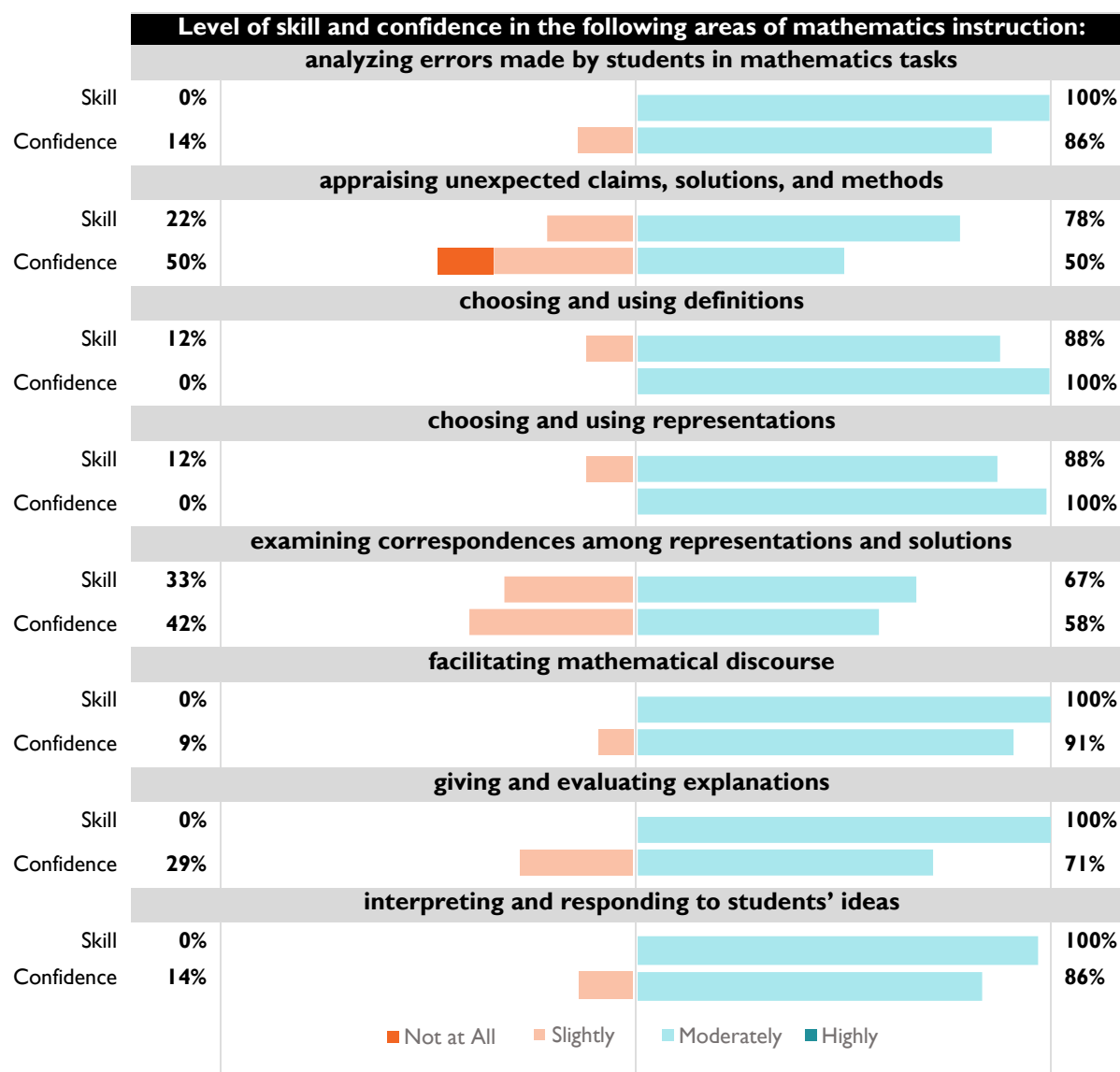


Figure 5. Participants' Level of Mathematical Skills and Confidence¹¹

¹¹ Question asked only of math-focused ELM participants. Fourteen math teachers responded to these questions.

Cohort I Focus Groups

The teacher participants were asked to describe the impact their participation had in two areas of their profession. First, how the ELM project influenced their thinking about teaching and student learning. Second, changes they had made in their instructional practice. Findings to these two areas are described below.

Influence on Thinking about Teaching and Student Learning

Teachers in both focus groups shared that **Margaret Heritage's presentations in 2016 and 2017 impacted their thinking about teaching and student learning, and provided a foundational understanding of formative assessment theory and practice.** For instance, one teacher explained that Dr. Heritage introduced a new way of checking for student understanding which then gave him/her the tools to modify lessons or strategies as needed:

[Margaret Heritage's presentation at the 2016 training] just really grounded my understanding of things, and . . . that alone kind of affected a lot more of what I was doing in my classroom than almost anything else in the program. Being able to do formative assessments throughout the year to check . . . they were very helpful to me because they helped me see some of the standards from directions that I would not have naturally done. I did do quite a bit of modifying on a couple of the lessons, but it did give me a really strong foundation. I got to the end of the lessons and found students had really achieved more.

For others, **Dr. Heritage affirmed their own views on the differentiations between summative and formative assessments, and ways that the formative assessment process can support students in their self-efficacy skills and their motivation for learning.**

I think that listening to Margaret Heritage last year and again this year has made a huge impact. . . Just thinking about how you listen to kids . . . and that assessment is not just what the district tells me it has to be about with the summative and the benchmarks. And, we are calling a benchmark assessment a formative, but it is not. It is a benchmark. Finally, I heard someone speaking a language that I spoke.

[W]hat Margaret Heritage was saying yesterday with formative assessment is you need to be identifying students' strengths, too, because especially those kids who feel like they do not know anything . . . if they have a map in front of them and they can see stuff colored green, I mean, they do know stuff. I think that they forget that and they do not realize that.

Teacher also shared that the **ELM project also is a means for helping to developing students' self-efficacy and active learning skills, and has the potential to help increase students' self-confidence.**

For me it has helped me to have my classroom be more student-centered rather than me doing everything, me teaching, me speaking, me answering my own question sometimes.

I have been there [at the school] five years and I am like, “Oh, my god. How do I work with kids that only come to school 17 days out of the year, 25 days out of the year, but yet we pass them on?” How do I fill in those missing gaps?” . . . [T]hey just give up, and they do not go back to school, and . . . they just feel like a failure. . . . So if this can fit that, which is why I have been driven towards it. . . . Seeing those kids have success and feel good about it is exciting. Maybe there is hope.

Discussions also revealed that **teachers understand the value of the maps in particular as a means to pinpoint learning gaps and to find links between specific academic content to navigate learning pathways.** Teachers found the maps were an effective tool to help reveal students’ thinking and misconceptions. They explained that the breadth and depth of the maps helped them to make those connections while at the same time breaking down the content into many singular skills, revealing the “subtleties” of students’ skills and knowledge.

[S]ometimes I get really stuck with teaching a lesson. Why cannot these kids get this? Why do they not understand it? . . . Then I realize there is something higher up in the map that they are missing, which fundamentally makes it impossible for them to understand this. Just having the knowledge that, wait, I need to back up, and now that the map is going to be easier to use. It will be easier for me to go in and try to identify what that is and use that.

[I]t has made me more conscious of the connections that you can make versus an isolated skill. I look at that skill and I know that somewhere out there, there is a connection to that one particular skill.

[W]hen you look at the solution guide . . . I would always look [and see the] . . . common mistakes. . . . [W]hen you look at the maps and how they are broken down . . . when you start to really look at student responses and explanations you really start to notice . . . some of those subtleties of those skills, and the different parts of it, and how it breaks down, and the depth of the student understanding when you look at all of those different skills together.

When you have those conversations with kids, we make a lot of assumptions as math teachers of what we thought they were doing. . . . So . . . those subtleties . . . they are there [in the maps].

Changes to Instructional Practice

Several themes were revealed about the ways in which teachers have changed their approach to instructional practice because of their participation. One primary theme that emerged was that **teachers have used the maps to implement more personalized learning strategies and differentiate instruction by targeting specific skills and knowledge and encouraging students to be more responsible for their own learning, thus increasing student motivation.** In some instances, teachers used the maps as an instructional guide without using any supporting materials. Focus group discussions also revealed that teachers are at different stages in using the maps for these purposes. For instance, one teacher described a method of using visual cues to show students their progression or regression in their math skills by providing them maps with a color-coded scheme.

For some teachers, the previous school year was a time for learning how to effectively use and integrate the maps into their practice, which has helped to build a stronger foundation for how they would like to use the maps in the coming year with their students.

[W]e got away from grades this year, and I started the maps. . . .I would take the map and then formatively assess them, but every once in a while give them what looked like a summative to them and be more pointed about how I ask them, and then I would grade them based off of green, yellow, red. . . . [A]nd started just showing kids more progress versus a grade. Once the kids started getting the idea that we are not doing a grade, we are trying to grow, the kids started growing faster because they wanted that green. Some of them would go from green back to yellow, which told me they were doing procedures rather than understanding, so I would make them go back and redo it with another concrete model. Well, when they started staying in the green . . . they understood what they were doing and they could see. Then I would show them the map . . . You went from here to here, so you can do math.

[E]ven though it [the map] did not have the lessons with it, I printed that out and had it in my folder for all my students, and so it worked for me for that.

I have been giving the maps to my students at the start of the unit. I feel like they are starting to do that on their own, where they see, “Oh, well, this is what we did today. . . . I know what we are heading to.” And I think I need to do more of that now. . . . We have our one year in. We know it is there. Now we can play more. Because I see the potential for the students to be able to take control of their learning if they have it in front of them.

I got this idea that if we give a kid a map and they can sit and go through their nodes, then I can have folders ready for them so that they can say, “This is where I am at. This is some explanation.” . . . I mean really enrich and really remediate, but not bore the kids who are still average, too. I am in a specialty type class, but we need to be doing this in our regular classrooms. . . . They always say, “I do not know how to differentiate.” Well, it shows you exactly what to do. Now all we have do is put the resources in place for them to be able to pull from those nodes. . . . Getting there is like a little bit of running through mud right now.

One teacher described the challenge in using the maps for direct instruction with young students, noting that the language found in the maps is aimed at students in higher grades.

I am struggling in just the position that I am going into in figuring out how to get it to be more student use, because I like the idea of students being able to see the map and see where we are going and see what we are doing, but on a lower elementary end nothing written is student friendly. . . . They need to see where we are and where we want to go, but in a very primary [way].

Teachers also described ways in which they have **used ELM materials to supplement their curriculum by using instructional units to enhance a lesson**. One teacher shared that, as a special education teacher, he/she would have benefitted from having shorter lessons that would complement the instruction students receive in their other classes.

I would first kind of do what the curriculum said to do, and then I would bring it [an instructional unit]. Now we are going to look at it in a whole different way with this unit that they want us to do. The kids really glommed onto it. It was engaging. They were right with it. They loved looking at it and pretending to be this different character, then the main character. I was like, "You have to think about somebody totally different than yourself," and then to add acting into it is like, whoa. They are just blown away by it.

I tried to implement my curriculum so that if my administrator were to come in, they could see that I do have the books out that we are supposed to be teaching with. But then I would implement this stuff. It was seen that I was integrating and being more open to trying new ways of teaching.

I am special ed[ucation] as well so these were all additional supplements that I was using because they are getting their standard in their classroom and then I am doubling it in my room. I cannot do a unit that in-depth. I do not have the time to do it that in-depth. So when they are looking at adding more resources, I like that they give that much, but I would rather have more in smaller segments that I could do mini lessons with multiple things rather than one huge lesson that I am not going to be able to spend five class periods on.

. . . or to replace a lesson:

[W]e put it [ELM materials] in our core curriculum. . . . [T]here are some gaps in it that are not very strong, and so we looked for some of the [instructional] units that we could use, and . . . they will learn it really at a different level than we did the last few years. It did work for that. . . . [I]t was much stronger than what was in our core curriculum. Now we used the story to start with that was in our curriculum, but we did the lesson, and it was very, very different.

Another theme was that the **strong integration and presence of the Common Core Standards as key guiding elements for instruction** was, for some teachers, a new way to approach instruction.

[T]he maps really pull all of those [Common Core Standards] out and give them all equal importance and then tie them everywhere. I think it is the multitude of the nodes that has really changed it for me.

I was looking at it [Common Core Standards] in a broad way with my benchmarking, but this—we are honing in on a standard and this is how you are doing on that standard, so that was different for me to see that.

I would be able to print up those nodes where he [my student] was missing, and then . . . I would give her [my aide] directions on what to do, because, this is a standard. . . . and it looked important. . . . [I]t gave them direction that had a hammer behind it.

[Y]our standards are your curriculum. And your resources are a tool, so when your tool guides you, sometimes you do not hit all the standards. That is what is nice about this—it is the standard, which should be our curriculum. Not Journey's, Wonders, whatever those are.

Lastly, teachers shared ways they have changed their assessment strategies, such as using the maps as a guide for framing questions, and embedding more frequent, “in-the-moment” formative assessment activities.

[The maps are a] new lens that I look at really any of my assessment questions through . . . now when I am looking at how I am phrasing a question or what I am asking to really get something that is going to more specifically identify some of those gaps and misconceptions.

[F]or me, the thing that really changed is making sure that I had specific, formative assessments for every lesson or make sure that I was checking in, and one specific example was whether the information [from the lesson] came from their own heads or from the book.

I am more intentional about backtracking to see what the children have missed. . . . [and] more intentional on the in-the-moment formative assessment to see where they are and who does not have it and where the gaps are.

Cohort 2 and Returning Cohort 1 Summer 2017 Training

An evaluation survey was administered to attendees of the summer 2017 training. 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 2 for additional detail):

- **Facilitator Quality:** Nearly all respondents (99%) agreed or strongly agreed that the facilitators were knowledgeable about the subject matter and encouraged questions and participation.
- **Materials:** All the respondents (100%) agreed or strongly agreed that the materials were research-based. Nearly all respondents (97%) also agreed or strongly agreed that the materials were relevant to mathematics or ELA teachers.
- **Practical and Environmental Issues:** Respondents were less likely to agree (49% agreed or strongly agreed) that the room temperature was comfortable.
- **Objectives:** All respondents (100%) agreed that the objectives of the training were clear. Nearly all respondents (96%) agreed or strongly agreed that the objectives had been accomplished.
- **Content:** Most participants (99%) agreed or strongly agreed that the topics covered in the training were relevant to the ELM project goals and 97% agreed or strongly agreed that the information presented was comprehensive. Respondents were less likely to agree (77% agreed or strongly agreed) that prior to attending this training, they were already knowledgeable about the academic content taught to children that is modeled in the maps.
- **Training outcomes:** All participants agreed or strongly agreed (100%) that the training provided them with information and resources that they can access for use in the future

and that the knowledge they gained from examining the learning map resources could be incorporated into their teaching practice.

- **Quality, Relevance, and Usefulness:** All or nearly all respondents also agreed or strongly agreed that the information provided was useful (100%), high quality (99%) and relevant (97%).

Table 1. Evaluation of Training by Item

	<i>n</i>	NA	SD	D	N	A	SA	<i>M</i>	<i>SD</i> *
Facilitator Quality									
The facilitators were knowledgeable about the subject matter.	77	--	--	--	1.3%	18.2%	80.5%	4.79	0.44
The facilitators encouraged questions and participation.	78	--	--	--	1.3%	11.5%	87.2%	4.86	0.39
The facilitators had good presentation skills.	78	--	--	1.3%	2.6%	38.5%	57.7%	4.53	0.62
The facilitators included a variety of learning activities.	78	--	--	--	11.5%	48.7%	39.7%	4.28	0.66
Materials									
Materials were culturally sensitive (free from ethnic, gender, or class biases).	76	2.6%	--	--	9.2%	27.6%	60.5%	4.53	0.67
Materials included diverse viewpoints.	77	--	--	--	18.2%	35.1%	46.8%	4.29	0.76
The topics and materials are relevant to mathematics and/or English language arts educators.	78	--	--	--	--	25.6%	74.4%	4.76	0.43
Materials were research-based.	78	--	--	--	--	14.0%	86.0%	4.90	0.80
Practical and Environmental Issues									
Materials (including visual aids) supported the training goals.	78	--	--	--	3.8%	30.8%	65.4%	4.62	0.56
Pace of the training sessions was adequate.	78	--	--	1.3%	11.5%	46.2%	41.0%	4.27	0.71
Length of the training was adequate.	78	--	--	1.3%	9.0%	42.3%	47.4%	4.36	0.70
Seating was adequate and arranged appropriately for the activities.	78	--	--	--	2.6%	28.2%	69.2%	4.67	0.53
Room temperatures were comfortable.	78	--	11.5%	15.4%	24.4%	26.8%	21.8%	3.32	1.29
The meeting location was accessible.	78	--	--	--	2.6%	26.9%	70.5%	4.68	0.52
Objectives									
Objectives for the training were clear.	78	--	--	--	--	25.6%	74.4%	4.74	0.44
The objectives were accomplished.	78	--	--	--	3.8%	32.1%	64.1%	4.60	0.57
Content									
The training covered the range of topics I expected it to cover.	78	--	--	1.3%	2.6%	42.3%	52.6%	4.48	0.62
The training addressed the topics in sufficient detail.	78	--	--	--	9.0%	41.0%	50.0%	4.41	0.65
The information presented was comprehensive.	78	--	--	--	2.6%	42.3%	55.1%	4.52	0.55
The topics covered in the training were relevant to the ELM project goals.	78	--	--	--	1.3%	24.4%	74.4%	4.73	0.47
Prior to attending this training, I was already knowledgeable about the academic content taught to children that is modeled in the map.	78	--	--	2.6%	16.7%	53.8%	26.9%	4.37	0.72
Outcomes									

	<i>n</i>	NA	SD	D	N	A	SA	<i>M</i>	<i>SD</i> *
The training provided me with information and resources that I can access for future use.	78	--	--	--	--	21.8%	78.2%	4.78	0.42
The training increased my knowledge of how to use the learning map resources.	78	--	--	--	1.3%	21.8%	76.9%	4.76	0.46
The knowledge I gained from examining the learning map resources can be incorporated into my teaching.	78	--	--	--	--	21.8%	78.2%	4.78	0.42
I will incorporate the use of learning map resources into my teaching.	78	--	--	--	1.3%	20.5%	78.2%	4.77	0.45
The training increased my knowledge in the use of learning map resources for formative assessment.	78	--	--	2.6%	1.3%	30.8%	65.4%	4.59	0.65
The knowledge that I gained on use of learning map resources for formative assessment can be incorporated into my teaching.	78	--	--	--	1.3%	28.2%	70.5%	4.69	0.49
I will incorporate the use of learning map resources for formative assessment into my teaching.	78	--	--	--	1.3%	24.4%	74.4%	4.73	0.47
The training met my expectations.	78	--	--	--	6.5%	26.0%	67.5%	4.61	0.61
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).	77	--	--	--	1.3%	28.6%	70.1%	4.69	0.49
Overall, the information provided was useful (i.e., applicable to my teaching responsibilities).	78	--	--	--	--	29.5%	70.5%	4.71	0.46
Overall, the information and activities were relevant (i.e., timely, and worth the time and effort)?	78	--	--	--	2.6%	33.3%	64.1%	4.62	0.54

Note. Percentages may not sum to 100 due to rounding. NA = not applicable; SD = strongly disagree; D = disagree; N = neutral; A = agree; SA = strongly agree, M = mean, SD* = standard deviation.

Second, the survey requested respondents to indicate their agreement to 10 questions related to the ELM software (see Table 4). Generally, it appeared the respondents felt comfortable in using the ELM software. Only 10% of participants agreed or strongly agreed that they would need the support of a technician to use the software and only 12% of participants agreed or strongly agreed that the ELM software was unnecessarily complex. Participants generally thought the ELM software was consistent and not cumbersome. However, almost one fifth (18%) agreed or strongly agreed that they need to learn a lot things before getting going with the ELM software.

Table 2. Evaluation of ELM Software by Item

	<i>n</i>	NA	SD	D	N	A	SA	<i>M</i>	<i>SD</i> *
System Components									
I think that I would like to use this ELM software frequently.	78	--	--	--	--	21.8%	78.2%	4.51	0.53
I found the ELM software unnecessarily complex.	77	1.3%	16.9%	48.1%	22.1%	7.8%	3.9%	2.33	0.99
I thought the ELM software was easy to use.	76	--	--	--	--	21.8%	78.2%	3.70	0.89
I think I would need the support of a technical person to be able to use the ELM software.	77	--	18.2%	53.2%	18.2%	6.5%	3.9%	2.25	0.96

I found the various functions in the ELM software to be well integrated.	78	--	--	2.6%	1.3%	30.8%	65.4%	4.13	0.59
I thought there was too much inconsistency in the ELM software.	77	1.3%	29.9%	51.9%	11.7%	2.6%	2.6%	1.94	0.88
I would imagine that most people would learn to use the ELM software pretty quickly.	78	--	--	16.7%	33.3%	39.7%	10.3%	3.44	0.89
I found the ELM software very cumbersome to use.	77	--	20.8%	42.9%	26.0%	9.1%	1.3%	2.27	0.94
I felt very confident using the ELM software.	78	--	--	10.3%	21.8%	52.6%	15.4%	3.73	0.85
I needed to learn a lot of things before I could get going with the ELM system.	78	--	23.1%	44.9%	14.1%	11.5%	6.4%	2.33	1.15

Note. Percentages may not sum to 100 due to rounding. NA = not applicable; SD = strongly disagree; D = disagree; N = neutral; A = agree; SA = strongly agree, M = mean, SD* = standard deviation. Items 2, 4, 6, 8, 10 are reverse worded; therefore, a lower mean is the more desirable response.

Participants provided many insightful comments in response to the four open-ended prompts: most useful aspect, least useful aspect, I learned, and appreciation/concerns/suggestions. Key themes are presented in the following paragraphs. Verbatim responses supporting these themes are found in Appendix D.

In general, the participants found the sessions and the material provided very helpful. Getting to use the software and exploring the site were mentioned often as the most helpful aspect of the training. The activities at the training and the materials provided were also mentioned repeatedly as important to the participants. The speakers, particularly Karen Karp, were mentioned by many participants. Participants found the ELM team and support staff to be very helpful and supportive. Some noted that the time to network and collaborate with other teachers was a valuable aspect to them. The panel discussion and hearing from Cohort 1 were both mentioned by participants as being useful. Lastly, a smaller number mentioned that getting the bigger picture and history behind the project was helpful.

Approximately half of the participants ($n = 41$) responded to the open-ended question about what they considered the least helpful aspect and, of those, five responded along the lines of ‘nothing’. However, there were a range of things that other participants considered to be the least useful to them. Bruce Frey’s presentation on assessment was indicated by many participants as not helpful. It was noted that some lessons and features were not ready yet, which detracted from the training. In particular, the locator tools were not ready, which confused people in the training. Additionally, there were a variety of aspects that individual participants mentioned as unhelpful, including more time on the software, not having a national speaker for ELA, and repetition in material.

In response to the *I learned* prompt, over half the participants who answered noted that they learned about the ELM software and how to use it (Table 5). Responses ranged from [I learned] “all about ELM and how to use the site and software” to “how to use the map software to integrate it with instruction” to “a lot about the standards as well as the connections between them as well as the software.” Many participants wrote that they learned instructional practices that they plan on taking back to their classroom, including new concepts, new ways to understand student knowledge,

and how to find knowledge gaps. Some mentioned that they learned quite a bit about formative assessment, both in general and related to ELM. Additionally, there were some Cohort 1 members who noted that they learned the updates to the software.

In the final prompt, *Appreciation/Concerns/Suggestions*, participants covered a wide range of topics. There were many comments thanking and noting appreciation for the ELM team and the guest speakers. Some participants also noted that they appreciated the quality of the training and the food. Participants also offered a variety of other suggestions and concerns. For the software, some participants expressed that it was too complicated and that it was overwhelming. Another area in which participants offered suggestions was the presenters. Several participants wanted a national ELA speaker, would have liked to have heard Karen Karp speak, and/or found the presentation on classroom assessment not useful. The overall tenor of the comments was quite positive.

Comparing the year 1 training evaluation survey to that of year 2, participant responses to both the scored and open ended questions again showed that in year 2 participants enjoyed the training and learned from it. Getting time and direction to learn the software was very valuable to them. There were fewer issues with the usability of the software in year two. Participants were again impressed with the quality of the training, and the knowledge, and professionalism of the ELM team. There was some frustration that tools were introduced to them before they were fully operational and that the classroom assessment speaker did not fit well with the training. Overall, many participants were excited about the ELM materials and learning map software and interested in using both in their teaching.

Successes and Challenges

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

Project Staff

Staff members were asked to reflect on their experiences working for the ELM project. They discussed the types of supports they need to successfully carry out their individual roles and responsibilities on the project. They were also invited to reflect on McREL's survey, focus group, and interview analyses, and to comment on anything that was unexpected, encouraging, or that needs attention. Staff also shared the successes as well as the challenges they have experienced thus far. Described in this section are staff's responses to these four areas.

Staff Support

Project staff were asked what types of supports they need to successfully undertake their roles and responsibilities in the ELM project. For some, their needs are being met in the following ways: technical, financial, and human resources support from the university; prompt communications from staff; information on current priorities and issues; and having a "committed

team.” While these staff members shared that, overall, they have the support and resources they need to fulfill their role and responsibilities, one of these staff members wanted “better insights into the thoughts of the team.” Several staff members identified the need for “more manpower,” that is, more staff to complete the work—particularly with the ELA content. Several also specified a need for more clarity on roles and responsibilities and “a more clearly defined hierarchy” of staff members. Some staff expressed feelings of uncertainty about who to approach with questions or ideas and “understanding, administratively, who I go to under what circumstances.” Relatedly, some staff emphasized that decision-making responsibilities and clear expectations for all staff need to be more apparent. Some staff described the direction, goals, and priorities of the ELM project as being ambiguous.

[I]f you don't know what your role is on a project . . . then how do you know where to focus your attention or how do you know when to ask questions? Or when to make decisions on your own? It can be challenging.

[W]e're all kind of limbo at the moment, because now we're short on staff in a lot of ways, and we're not sure exactly where the project's going to go, or how we're going to make up for those missing people. And there isn't a lot of discussion along those lines.

Further, staff shared the perception that the overall direction of the ELM project has a need for greater collaboration, energy, planning, and strategic outreach to help move the project forward.

[I]t would just be nice to get more collaboration and just get more excitement going with it. Because it should be fun. It should be exciting. . . . We should be bouncing ideas off of each other. And it's just kind of stagnant.

[We need] forethought, and really considering what is best for the team, and providing a lot of supportive guidance for the direction that we want to go to. And sharing with everyone what that direction is, and where we're all going, so we can go as a team.

[W]e don't have a visionary. . . . We don't have that cheerleader who's saying, "This is why we do this project. We do it to improve things." It just kind of feels like everybody's going through the motions to get the requirements met and moving on to the next thing.

Reflections on Evaluation Reports

Members of the ELM project team were asked to share their reflections on the McREL evaluation reports.¹² They were first asked what, if anything, surprised them about the findings. Reactions from staff were mixed; some were not surprised by what they read, noting that the findings were more “confirmatory” of their own experiences with the project, such as the teachers’

¹² McREL reports provided to the ELM project team include: Cohort I spring survey, 2017 training survey, 2017 teacher focus groups, and 2017 state partner interviews.

concern about the lack of ELA materials. Others, however, did not anticipate some of the reactions from teachers or their needs, as explained by one staff member,

Teachers' reaction to a lot of things was not what we expect. I think that's a common theme throughout this project. We keep trying to guess what the teachers will want, and how they will react, and we're almost always wrong, it turns out.

Some staff were struck by teachers' positive feedback and excitement about the project, as evidenced in the teacher surveys as well and by their own observations during the summer 2017 training. Staff described the teachers as "so excited," and that they "seem to like what's going on [with the project]." They explained that this was surprising because, as one staff member commented, there is a "distance and detachment," between staff and participating teachers. Others noted that very few teachers completed the unit feedback surveys during the previous school year and that often the feedback that was received was "superficial."

I don't know if that's because the teachers are too busy, don't understand that we mean it when we say we want feedback, or if it's just truly that the units are that good that the teachers don't have anything to add. . . . I'd like to be really confident that there just so good that the teachers just have nothing else to say about them.

One staff member who shared similar perceptions about the lack of teacher engagement was "shocked" by the teachers' enthusiasm and engagement during the training. "Part of that was our fault," this staff member added, "because we didn't do a good enough job communicating with our teachers last year." Another staff member was "pleasantly surprised" and found it encouraging that teachers recognized and praised project staff's responsiveness to teacher feedback and their efforts to make adjustments to ELM products and processes based on that feedback.

Two staff members mentioned their surprise about teachers' critical feedback about the learning map software. One of these staff members found teachers' comments regarding the "inconsistency" of the software "troubling" because he/she did not fully understand where teachers' perceptions of the inconsistencies lay, and the feedback did not provide this level of specificity. This staff member also expressed concern about teachers' descriptions of the software as "cumbersome." He/she acknowledged that although staff have worked to make the software as user-friendly as possible, the nodes in the map model can be cumbersome, due to the complex nature of the content. This staff member added that teachers could benefit from additional training on the connections between the standards and the concepts and skills that were included in the learning map software. For the other staff member, the reports led staff to "rethink" some of their communications regarding the software, and emphasized the importance of mindful messaging about the purpose of the project and teachers' role in it.

It's more in how we interact with the teachers than anything technical. But technical as well—avoid implying that the software is unfinished. Avoid trying to tell them what to expect, and let them draw their own conclusions. Or better, imply that the software is finished and a complete product, and let them use it with confidence.

This staff member explained that teachers perceived the software to be “rough and unfinished” as a result of project staff’s comments about the research and development nature of the project.

In addition, one staff member mentioned teachers’ concern about the delay in rolling out the pre- and posttests, and added that staff “put extra effort into getting it done, out the door, and [getting] a good quality product out.”

Successes

Project staff shared the success they have experienced thus far, including the high quality of the learning map software and the instructional materials, the positive reception and engagement of teachers, and the summer 2017 training. Staff members praised the development of the ELM products as a major accomplishment that provides teachers with “high quality . . . lesson units . . . [and a] framework, the basis on which to guide the students towards acquiring target standards.” Participation in ELM has given teachers the tools to implement new pedagogical practices; one staff member described the learning map software as a “welcome relief” to teachers, and that the maps are a “good way to lead teachers to make better decisions” about adjusting instruction and monitor student progress. Another shared that the ELM products, in the hands of effective teachers, can be powerful tools in improving instruction, explaining,

You can tell that they’re fantastic teachers. And they still appreciate what we’re doing because it has them think about the math, maybe, in a different way, or it provides some connections that they hadn’t considered, or the research behind why you might . . . teach this in this way. I think that we are successfully providing teachers with information they didn’t readily have access to before the project.

Staff described the ELM products as “user-friendly,” “teacher-centered,” and “extensible and developable.” “We are not getting complaints that it’s too cumbersome, too hard,” noted one staff member. (However, another staff member recalled reading teachers’ comments from McREL’s survey analyses indicating software is “inconsistent and cumbersome.”) Staff were also pleased to learn how teachers are using the software in unexpected ways, such as printing out learning maps for students so that they can visualize their progress, and framing lessons in ways that demonstrate to students that not everyone learns at the same pace, which is an “unintended positive consequence to this approach to lesson planning.” One staff member was especially pleased with teachers’ positive feedback regarding the teacher notes, commenting,

[W]e were leery about [the teacher notes], thinking that teachers may not necessarily take the time to read [them]. . . . And hoping that they would, because part of what we’re trying to do is create more of a conceptual awareness and understanding when teaching math, as opposed to a procedural one. So the teacher notes are an important part of that, and they highlight the structure of the map as well. So I think that how positively they responded to the teacher notes, and how much they like them, was amazing. It was fantastic. We were so excited.

The level of teacher engagement and enthusiasm was another positive outcome described by several staff members. The teachers are “so open-minded and willing to sometimes step out of their

comfort zone,” said one staff member. Though some expressed concern about Iowa dropping out as a state partner, one commented that it was a “very positive statement” that some teachers from the Iowa cohort chose to continue their participation in the project. Another mentioned teachers’ comments about their students’ increased understanding of concepts and “seeing better results.” One staff member emphasized the importance of project staff engaging in “personal, professional” communications with teachers as a means to maintain relationships and, ultimately, continued participation:

We have a lot of teachers on board that are really buying into this, that really feel an investment in this. . . . We aren’t anything without them. . . . We need to know all the good, the bad, the problems, anything that’s going on. . . . [A]ll of us have tried to strike up just professional, personal relationships with the teachers to keep them onboard.

Some staff also spoke of the successes of the summer 2017 training. They described positive and collaborative interactions with the teachers, commenting that teachers received better preparation than in the previous year’s training. As one staff member noted, attendees gave the training “high marks . . . [which] made me really happy because we worked really hard on all aspects of our training.” Teachers had more opportunities for hands-on learning with the mapping software than in the previous year’s training; one staff member observed that “Most of the teachers at the training seemed very confident with manipulating the website and using the maps and the nodes.” Further, Cohort 1 teachers’ experiences with the ELM products were leveraged throughout the training, as they shared examples of how they used the ELM materials in their classrooms, which “helped give [Cohort 2 teachers] ideas.”

Challenges

Along with the many successes of the ELM project have come certain challenges. Staff members indicated that the loss of staff and the transition in leadership has affected progress. For instance, some staff members shared their concerns that staff departures may impact the development of future ELM materials. “The project seems like it has the potential to be very powerful,” explained a staff member, “and there’s only so much that a few people can do.” Relatedly, one staff member described the challenges related to anticipating the work required to plan and deliver in-state trainings, explaining that the trainings are “almost an interruption to our work. . . . Because everyone stops working on developing resources and putting together other materials and they stop and start planning for the training.” Another staff member hoped that conducting site visits would still be feasible with the reduction in staff. Other staff members were concerned about hiring new staff with the “right skills” to keep the work moving forward, and who can “support the current staff [and] not make extra work.” Further, hiring staff who are “better researchers,” and having “a blend of practitioners and people who understand the university setting,” was, upon reflection, one staff member’s conclusion about future staffing needs. In addition, similar to staff’s comments from the previous year, some staff indicated that the change in leadership was and continues to be a challenge; particularly regarding staff roles and meeting project goals:

[A]s the project grew, the communication was just a little more difficult. There's a lot of pieces to keep coordinated and I think that's challenging to keep everything moving in the right direction. . . . And then keeping [up] the communication so that everyone is clear on all of the different pieces and what everyone's role is [is a challenge].

[The] leadership role just didn't get replaced. And there wasn't really anyone that stepped up and had a really good vision or direction to take the project, so it was us fumbling around, trying to stick to the original vision, which is what we knew. And trying to make our way from there."

Another challenge has been the development of the remaining ELA instructional units, which has been "slow going." Several staff indicated that they would like the development of these materials to be further along. One staff member explained that creating the materials in a "reasonable timeframe" is challenging, stating,

A lot of time and effort goes into each one [instructional unit], so they were created at a slower rate I believe and it wasn't originally intended. We didn't want to provide teachers with low quality material, so we wanted to take the time and really provide them with high quality lesson units. That takes time.

External communication and collaboration was another area of concern for project staff. As described in the External Communication and Collaboration section, several staff reported having little to no understanding of the role of the state partners. "They are just kind of there," commented one staff member. Beyond their interactions with state partners, staff member communication with participating teachers was another area of concern. As one staff member explained,

[T]eachers were commenting . . . at the training that they're frustrated, that they want to meet their state partner, they want to hear from their state partner, what is the role of their state partner, who is their state partner? We tried to give an opportunity for the state partners to be involved with the teachers there at the training, and they didn't. Most of them didn't take advantage of that.

Some staff member also expressed a need to increase collaboration with, and buy-in from, other external stakeholders, including principals, district leaders, and coaches. "Those are the people that have to be engaged at the end of the project if this project is going to continue to scale up," explained one staff member. However, this staff member also noted that although efforts to reach out to principals in particular had minimal reception (e.g., to attend an informational webinar). Relatedly, ramping up recruitment efforts is another challenge staff members currently face; staff indicated that they aim to leverage Cohort 1 and 2 teachers' professional networks to help with reaching their goal of 400 participating teachers.

State Partners

The state partners described several successes resulting from the ELM project thus far. State partners indicated that improving teacher knowledge was a success of the project. One state partner referenced increased knowledge of formative assessment while two other partners

noted increases in teachers' understanding of content. One state partner said, "I do not think that [increased understanding of content] was one of the goals but it is kind of interesting because I think they [teachers] are learning more about math when they are using the maps." Two state partners believed the development and availability of high-quality materials for teachers to be a success in and of itself. One state partner commented that receiving the funding and initiating the ELM project was a big success; a project that was actualized from what was learned from the Dynamic Learning Maps project. This state partner commented, "The Dynamic Learning mapping was tremendously hard to do and the fact that they were able to map as much as they did, I think is a great success." Another state partner commented on ELM project staff's vision of what is needed to make the maps usable, saying, "They are recognizing that they cannot just take the map and give it to the states, that there has to be something else. The lessons must be really vetted and user-friendly. They are gearing up for that sustainability piece."

In addition to the successes, there have also been challenges. As discussed in the *Expectations for Teacher Participants* section, the **state partners expressed that state or district policies, including mandated standards and curricula, can create barriers to implementation of the units.** Along these lines, one state partner commented that the limited number of instructional units available, as well as the lack of alignment of the maps to the state's new standards, has impacted teachers' ability to fully implement the units. State partners also have found that operationalizing the project goals in a way that is measurable (i.e., being able to adequately respond to the research questions put forth in the proposal) is challenging. One state partner had observed teachers' improvement in "assessment literacy," but could not tie it to a specific goal and was unsure of how to assess their growth "in a meaningful way." Another state partner questioned whether participating teachers fully understand formative assessment, and remarked that she is "not seeing how the data collected will really tell us anything about how they used [the maps] formatively." Additionally, one state partner lacked clarity on what the intended outcomes are for teachers. This state partner explained, "In talking with some of our folks [participating teachers], they are not sure if their goal is to use the learning maps to move students, to help students progress, or if their goal is just to learn how to create better formative assessments and understand the role of formative assessment."

Other challenges mentioned by state partners included recruitment, buy-in from school administrators, and project sustainability. For instance, one state partner described difficulties recruiting for Cohort 2 because teachers "are overloaded"; another reported that project staff were "late" in providing information about Cohort 2 recruitment and that she was unclear about her role in the recruitment process. One state partner experienced push-back from principals who did not want their teachers involved in the project given that new "guaranteed and viable curriculum" had just been adopted and that other priorities required their time. Finally, one state partner highlighted continuity in staffing at ELM as a challenge to the sustainability and success of the project, with respect to having "enough people retained on the project that they know how to carry [the project] forward."

Communication and Collaboration

As a part of 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 invited to share 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. Described in this section are staff's responses to these two 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 the project co-principal investigator and one research/content team member. Several staff also reported having frequent, informal meetings to discuss ideas and share information. Perceptions about the extent to which communication and collaboration among staff members were effective and productive were mixed. Some staff members described the team dynamics among the research/content team and the technology team as high functioning, as evidenced by comments such as,

We [the research/content team and the technology team] all sit in a room together on a daily basis. And so, we communicate very well with each other. . . We talk to each other all the time and coordinate stuff. We run this project. As far as if it's run well, we do it.

[I]t takes a while to build up a . . . common language or a common way to approach [the work], so that . . . [people] can communicate and make effective progress. . . I would say it's partly time and partly getting comfortable working with people. There's always going to be some give and take. The technical people are going to want to do one thing, but it's not so good on the client side and vice versa. You've got to get into this mode where you're doing compromises and talking and it's just all about communication. . . I think we've been making good progress on that.

I feel really good about the internal communications. It's a great team that works very well together.

We're always talking and discussing how to improve on the various aspects of the project.

[O]ur communication has been very clear on how this project should keep proceeding.

Others, however, expressed less satisfaction—both about the communication and collaboration among the research/content team and the technology team, as well as among these two teams and the leadership/administration team. While some staff indicated that informal, small-

group collaboration is a regular occurrence, other comments suggest that staff tend to work independently of one another and primarily communicate during the biweekly meetings. Further, one staff member described biweekly meetings as “disjointed” and more of a time to share information but “not necessarily come up with ideas.” For several staff, there is ambiguity as to their role and responsibilities.

You always feel like it [communication] could be better. For the most part, we communicate weekly, as a group, in person, but then sort of work on our own departments, our own project, part of the project, independently. . . . I think we over rely a little bit too much on these big meetings, and there's not really as much communication between staff as there could be.

[W]e're kind of in each our own little separated areas and just the nature of kind of how the tone of the project has changed, we aren't sure if we should ask this person about this or just figure it out on our own. It's just not quite as easy. It's not quite as smooth. It's not quite as clear who to communicate with. A lot of times we're just kind of left with not knowing; something is stated, and everyone's aware of it, but it isn't really prescribed, who's going to follow up or what's going to happen.

[T]he communication I think between us [the research/content team and the technology team] for the most part is much different than communication coming from above. Where sometimes things aren't communicated, or they aren't communicated clearly. And that's not to say that it doesn't happen between project members, because there has definitely been some situations where there was a lack of communication. . . . And it's led to a lack of progress, maybe, on the project itself.

Sometimes it is a challenge to communicate with other staff members. I'm thinking of, if we need to communicate something to all of our participants, or to our state partners . . . it's hard to know who is supposed to do that. We spend time thinking about, “Okay, well, do we send this person an email and ask them to send us information? Or do we just send it and copy this person?” . . . Sometimes it's like, I know this is the right thing to do, I need to get this going, or I need to communicate this, but if I do it on my own, even knowing that this is the right thing to do, I don't want to cause hurt feelings or overstep.

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 1 to 5.¹³ Two staff members gave two ratings—one for the communication and collaboration among the research/content team and the technology team, as well as among these two teams and the leadership/administration team. Select comments from staff who gave a rating of 1 or 2 include:

¹³ 9 project staff provided a rating on the team's internal communication and collaboration; ratings were as follows: 2 (n=1), 3 (n=2), 3.5 (n=1), “3.5-4” (n=1), 4 (n=2), 5 (n=2). In addition, two staff members gave two separate ratings: communication among the research/content team and the technology team: 4 (n=1) and 5 (n=1), and communication among these two teams and the leadership/administration team: 1 (n=1) and “1-2” (n=1).

A one or a two, coming from the top down. . . . about that lack of communication coming to us.

It's unclear not knowing exactly who is supposed to do what, who is going to follow up with what. And then, if something's not followed through on, then what? . . . [E]verybody's just kind of put in a hard position. . . . [I]t ends up, two or three people will do the same thing. And then, it's wasted time, wasted effort, or it kind of creates this strange dynamic.

[Communication] between project staff and what's considered management, that barely, barely exists.

Select comments from staff who gave a rating from 3 to 5 include:

I think the most satisfactory is the [communication among the research/content team and the technology team.]

[T]here are some problems, but overall it's not terrible.

We could do better, but we could do a lot worse as well. . . . Sometimes there's different language and different understandings of things that I think we're trying to work on that and [to] be aware of that, but . . . I don't think it's anything real major.

[U]sually it's not a real issue because most people know what they do. Just sometimes, when we aren't all on the same page, we end up finding out about that at those big . . . biweekly meetings.

External Communication and Collaboration

Project staff also shared details of their communication and collaboration with state partners and their perceptions of these collaborations. Webinars are generally held on a regular basis (i.e., approximately monthly) with the project leads and state partners, and a newsletter highlighting project updates and activities is disseminated approximately monthly to stakeholders. Meetings with the state partners were described by staff as “unproductive,” “uncoordinated,” “unengaging,” “one-sided,” and “awkward,” and that state partners are unresponsive. However, one staff member mentioned that one state partner has been “very involved and would constantly follow up and ask questions.” Several staff speculated as to the reason for the lack of engagement. For instance, some acknowledged that the state partners have multiple obligations and that the ELM project is likely not a high priority for them; as one staff member stated, “I’m sure that our state partners have a variety of roles and this may or may not be a significant part of their role. . . . [S]ometimes that’s a little tricky in terms of making this a priority.” Further, one staff member suggested that “it’s harder to get people to talk when they’re just on the phone.” Another described a shift in the “tone” of the webinars, describing it as going from “[W]e’re all in this together. Let’s get this done. I want to support you in any way that I can,” to “You need to do what we tell you to do.”

Several staff reported that they are asked to attend the state partner meetings primarily when they are presenting or to answer questions about a specific issue. They indicated that in general they

have “little involvement” with the state partners. Staff described their lack of clarity as to the expectations regarding their involvement with state partners:

I’m not sure I’m allowed to talk to the state partners.

I have never felt like there has been any kind of encouragement to reach out to or try to collaborate with the state partners about recruitment or getting information to teachers or different aspects of the project. It seems like that’s overstepping our [the research/content team and the technology team’s] role in the project. It just never feels like that’s something that I could do. It seems like it’s more of a project director, deputy director role than a staff role.

We’ve been asked on a few occasions to think about what the state partners’ roles should be, and I don’t even know where to begin or how to start thinking about that, because I have no idea what their role is, or what it should be. . . . There’s a lot of mystery.

Some suggestions were offered for improving the communication and collaboration with the state partners. For instance, there were recommendations reduce the frequency of the webinars, which may, one staff member suggested, make the meetings more productive. Another staff member commented that the webinars have largely been “logistical and administrative” in nature, and suggested that including some “teacher voices” and having the research/content team attend and share the work they are doing may generate more interest and engagement. One staff member thought that including “essential questions” and key discussion points in the body of the email, in order to make them “available and obvious” to invitees would be more effective than sending them as an attachment.

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 1 to 5.¹⁴ Select comments from staff who gave a rating of 1 or 2 included:

[W]hat the state partners are communicating is not necessarily passed to us. So that’s kind of where I feel the communication breaks down.

I don’t know that the state partners were ever really considered or reflected upon. . . . [W]e need . . . we want their opinion, but it just wasn’t done the right way.

I think that’s evidenced in the fact that one of our state partners dropped out.

Select comments from staff who gave a rating from 3 to 5 included:

I would put the process as a four or a five. But the outcomes more like three.

¹⁴ 9 project staff provided a rating on the team’s internal communication and collaboration; ratings were as follows: 1 (n=2), 2 (n=1), 3 (n=3), 4 (n=3). In addition, one staff member gave two ratings: communication related to outcomes: 3, and the communication process: “4-5.”

[W]e're doing a lot of work on our side to reach out but because we're not getting much response, it makes me think we've got to be able to do something that makes it more effective. . . . Get them to want to know more and want to get more involved and want to be more engaged.

I think there's always ways we could improve. . . . [The state partners are] very, very busy people. In their state department, this is one more thing that was added on their plate.

There are some that I wouldn't know who they are, if I saw them in a room. . . . [But] there are some that do talk to us.

[T]hings were not as clear as they could have been . . . [and] just what they were supposed to be doing. I feel like we may have sent confusing messages at times. . . . I never knew exactly what we had told them and so I never knew exactly what they were supposed to be doing. . . . [I]t kind of seems like we didn't appear organized enough at times, which might have caused less interest on their part.

Most project staff reported that the team has discussed advisory board members' feedback and recommendations, and that several of these recommendations have been or are being addressed. Staff indicated that state partners have "given a lot of input on how we recruit," and that project staff have "tried to be sensitive to their preferences." Other staff shared similar perspectives; one commented that "we've been pretty good about being flexible and agile about reacting to good feedback and suggestions, particularly when it's from state partners and teachers." Further, in response to one advisory board member's concern about the using the term "diagnostic assessment" to describe the pre- and posttests, the term this is now used is "locator tool." Changes were also made to the feedback survey after advisory board members commented that it seemed to focus on the instructional units and activities, as opposed to how the maps are being used by teachers to make instructional decisions. Other changes and enhancements mentioned by staff included creating a stakeholder newsletter; keeping teacher notes brief (for ELA units in particular); and making improvements to instructional unit content based on feedback from the content experts on the advisory board, such as providing detail on mathematical practices in the teacher notes for the math units. One staff member noted that the team met to discuss McREL's Governance Board report and that "those suggestions and ideas are discussed and taken into consideration"; however, another staff member commented that since the Governance meeting, "not one of those suggestions from the Governance Board has been brought up with us."

State Partners

While the ELM staff were highly regarded, **state partners indicated there are some areas for improvement in communication.** They noted that the ELM staff overall have been very supportive. One state partner said, "ELM staff is always willing to listen to ideas and see what they can get implemented." Another state partner commented that it was helpful and interesting to hear about project updates from the other states during the monthly calls. However, there was some disagreement about the overall usefulness and quality of communication and collaboration. Only one state partner thought the monthly calls were well organized and useful. The other state partners described a variety of issues with the calls, including difficulty with scheduling, and whether having

calls was the most efficient use of time when other means of communication might suffice. One mentioned that at times there is little discussion during the calls, but acknowledged “that is on us [state partners], not on them [project staff],” and said that the state partners should be “more prepared” for the calls. Another state partner indicated that the calls did not seem important until they were being asked to recruit for Cohort 2; commenting, “I do not hear anything for a while and then suddenly, ‘Help us, help us with Cohort 2!’” In addition, two state partners noted a disconnect between project staff’s communications to state partners and teachers. As one state partner explained,

I just left those calls and I was not sure what I was doing with the information. I felt like ELM was . . . communicating with the teachers and ELM was talking to us. But those were two separate conversations. I do not know how to get everyone on the same page.

Another area of concern was communication about the recruitment process. Two state partners said the process for recruiting and on-boarding new teachers for Cohort 2 was not clearly communicated to them. They also lacked information about which project staff to contact with specific questions. As a result, the state partners indicated that these issues made recruiting for Cohort 2 more difficult.

State partners offered several suggestions about how to improve the quality of communication and collaboration. One state partner noted the “ad hoc” scheduling of calls made it difficult to fit them into her schedule, and suggested that meetings be changed to standing meetings, (e.g., the first Tuesday of every month), to avoid the multiple emails about scheduling. It was also suggested that ELM staff send calendar invites so that participants do not have to search their inbox to find the meeting times. One state partner suggested that email could be used as an alternative means of conveying information and that the calls could be used for matters requiring discussion and idea generation. To address the issue of not knowing who at ELM to contact, it was suggested that ELM project staff provide and update a staff directory with descriptions of staff’s responsibilities.

The state partners were asked to rate their satisfaction with the communication and collaboration amongst the state partners and ELM project staff using a scale of one to five, where one is not at all satisfied and five is very satisfied. The **ratings were quite diverse** with one state partner giving the relationship a rating of five, noting that the ELM team is “really valuable because they are helping us be successful and I appreciate that.” One state partner rated the communication and collaboration between a three and a four due to the difficulty in being able to regularly attend the monthly calls. Another state partner rated her initial experiences with communication and collaboration as a one or two but raised the rating to a three after she started communicating directly with the project manager. The fourth state partner provided a rating of three because “communication is not always on point. . . . [I]t is a little disjointed with what is needed, but . . . they [ELM project staff] are super positive.” This state partner summed up the communication from project staff, stating, “[I]t might not be the greatest information but they are really, really nice and very helpful.”

Conclusions and Recommendations

This evaluation report focuses on Year 2 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 four areas which align to the primary areas evaluated. Those areas include recruitment, expectations and implementation; impact on instructional practice; summer 2017 training; and communication and collaboration.

Recruitment, Expectations and Implementation

Recruitment

- State partners and project staff agreed that challenges in Cohort 2 recruitment arose due to “last minute” planning, late requests for support from project staff, and a lack of clarity around roles in recruiting participants. State partners also indicated that teachers’ workload impacted recruitment.
- Some states incorporated the project recommended “bring a friend” strategy of recruitment in which Cohort 1 teachers invited a colleague to assist them in recruiting participants for Cohort 2.

Expectations for Teacher Participants

- Teachers thought the expectations for their participation was reasonable, and most did not feel obligated to implement all six units nor was it imperative to integrate all parts of every unit.
- Participants are invested in the ELM project and wanted to complete as many units as possible.
- Mathematics teachers participated in the project to gain well-developed materials and for the collaboration with fellow math teachers. Most ELA teachers were unaware of what the ELM project would entail but were encouraged by administrators, project staff, or peers to participate.
- Expectations are reasonable, per state partners, but first-year participants and teachers with multiple obligations may struggle to implement all units with fidelity.
- Partners thought that expanding the ELM project to a broader audience (i.e., teachers who may show less interest or engagement) may prove challenging.

Implementation

- Teachers varied in the number of modules they implemented with fidelity; ELA teachers tended to implement none, three or six modules and mathematics teachers implemented three, five, or six modules; and overall the most common was none, three or six. However, focus group participants tended to feel as though they were not expected or obligated to implement all six units or all components of the units.
- Teachers who struggled to implement any of the modules indicated that the content was too complicated, they lacked sufficient time to be comfortable with material, or the modules did not align with the state standards. Some teachers said they had other responsibilities or curriculum to prioritize above the modules.
- The Teacher Notes video was the least accessed resource, whereas the Student Activity, Instructional Activity, and Student Activity Handout were the most used materials.
- State partners expressed a desire for continuing to receive information on the project's progression toward project goals and outcomes, and how participation changes instruction.

Impact on Instructional Practice

- The ELM project had an impact on teachers' instructional practices by assisting them to personalize instruction and support struggling students. Specifically, teachers noted that ELM materials and learning maps provided more data to help personalize instruction for students, and they changed their use of questioning strategies to show student thinking, make decisions about individual students' needs, and understand how students think.
- Cohort 1 participants used the ELM materials and learning maps to adjust instructional practice to keep students moving towards their learning goals, provide students task-specific feedback that helps them fill in gaps in their knowledge, identify where students are in their learning and what to learn next, help students reach their learning targets, and identify students' misconceptions.
- The summer training presentations increased teachers' understanding of formative assessment in addition to their methods to support students' self-efficacy and motivation.

Summer 2017 Training

- Cohort 2 and returning Cohort 1 survey respondents positively rated the facilitator quality, materials, and content of the summer 2017 training. Teachers also said the objectives were clear and accomplished; the training provided information and resources applicable to their professional practices; and the information was of high quality, relevance, and usefulness.
- When identifying the most helpful aspects of the training, teachers noted that they benefited from exploring and using the learning map software in addition to the support from speakers, ELM team, support staff, and the Cohort 1 panel.
- Most teacher participants reported that they felt comfortable and confident in using the learning map software and would like to use it frequently. Although many did not think they

needed support from a technical person, a few teachers indicated that they needed to learn more before using the system.

Communication and Collaboration

- Most Cohort 1 teachers said they were pleased with the prompt response of ELM project staff and appreciated project staff's welcoming attitude and ability to make personal connections with them during the training.
- State partners said that ELM staff were supportive and receptive to ideas during the monthly meetings.
- Some state partners indicated that there were challenges in scheduling and conducting the monthly meetings, and they questioned whether other communication methods may be more efficient in light of the primary messages conveyed during the meetings.
- State partners appreciated the opportunity to connect and collaborate with other states, and indicated that teachers valued collaborating and networking with their peers as well.
- Partners also desired more one-on-one and group interactions with participating teachers (e.g., site visits and quarterly meetings).
- Generally, project staff believed there is a need for improved communication and collaboration amongst the ELM project team.

Recommendations

Based on the findings and conclusions, the following recommendations are provided for ELM project staff to consider in the project's third year of implementation. Similar to the conclusions, recommendations are organized by four areas: recruitment, expectations and implementation; impact on instructional practice; summer 2017 training; and communication and collaboration.

Recruitment, Expectations and Implementation

Recruitment

- To improve recruitment efforts and buy-in, open the lines of communication to address stakeholders' questions and concerns around their involvement in recruiting and on-boarding as well as the project's intended outcomes.
- Provide participating teachers with specific talking points and responses to expected teacher reactions (e.g., "I do not have time to do this."). Consider providing one all-access account for the learning map software that participants can use for demonstration purposes.
- Clearly define the recruitment process to better inform stakeholders of their role in recruiting and on-boarding and provide an updated directory of project staff who can respond to questions during the process.

Expectations for Teacher Participants

- Clearly communicate the expectations for teacher participants (e.g., the number of instructional units to complete).
- Consider revising the expectations based on teachers' year of participation (e.g., reducing expectations for first-year participants during their first year of implementation and increasing expectations in their second year of implementation).

Implementation – ELM Materials

- Ensure that directions provided throughout the instructional units are clear and thorough.
- Consider providing a Microsoft Word version of the instructional units, and provide clear guidance on what can and cannot be manipulated, and in what ways. Design the instructional unit documents so that each section is bookmarked within the pdf or Word.
- Consider providing all materials for the ELA lessons (e.g., passages, stories) that a teacher will need to implement the lessons as this will decrease the burden on the teacher in needing to locate these materials.
- Consider providing a range of time estimations for the completion of a lesson; provide estimates based on low-level or high-level classes.
- Consider ways to better align the modules and resource content with state standards.

Implementation – Supports

- Explore ways to facilitate collaboration among all teacher participants, as well as among teachers within each state, district, and school. This includes during future summer trainings as well as during the school year.
- Continue to provide consistent and timely support via phone and email to participating teachers.
- Continue to utilize one email address for teachers to use for questions and feedback. This is helpful for both ELM project staff to have record of all communications and responses and for the teachers to have one contact.
- Consider providing a refresher webinar on using the learning maps and adding it to the ELM project website for reference for teachers wanting to review what was shown to them during the training to increase teachers' comfort with accessing and utilizing materials.
- Consider strategies to help teachers maximize time and align standards, modules, and other teaching responsibilities to implement materials with more ease.
- Explore ways to provide occasional “brown bag” or “question and answer” sessions on ways to use the learning map software.
- Consider requiring that there be at least two teachers from a district, to encourage collaboration. Further, explore ways to support district facilitation of periodic meetings for teacher participants from the same district.
- Continue to include school and district administrators in outreach and communication efforts.
- Provide teachers with their state partner contact information, along with information about their role and responsibilities, and the support they are expected to provide to teachers.

Further, ensure that project staff and state partners' roles and responsibilities are clearly communicated to teachers.

- Consider ways to support teachers challenges in implementing the units (e.g., printing, navigating PDFs, and creatively adapting materials).
- Communicate the expectations for the number of units to implement with fidelity and/or offer support in assisting teachers to implement more units by overcoming time barriers, increasing comfort with material, and aligning material with standards.

Impact on Instructional Practice

- Share anecdotes and concrete examples with prospective teachers and school and district administrators of how the ELM project has influenced teachers' thinking about teaching and student learning, as well as ways they are using and implementing the lessons and the maps in their classrooms, and using formative assessment strategies.
- Continue to provide high-quality support that assists teachers in refining and enhancing their instructional practices, and offer additional assistance to teachers by need (e.g., communicating students' progress with parents, learning maps software refreshers).

Summer 2017 Training

- Continue to set aside dedicated time for both new and returning teachers to explore the software during the summer training, offering additional support to those who are not confident in their ability to utilize the system.
- Consider including presentation topics that address more advanced pedagogical theory/practice.
- If feasible, show recordings of Margaret Heritage's presentation(s) during future trainings.
- Consider arranging training agendas so that teacher could attend all presentations, not just those specific to their subject area.¹⁵

Communication and Collaboration

- Enhance the flow of communication among all stakeholders and consider integrating technology-based networking and continuing education opportunities for teachers. A directory with job descriptions would increase partners' knowledge in contacting the appropriate project staff.
- Bridge communication gaps to ensure stakeholders and participants receive the same information and further connect their involvement in the project implementation and plans.
- Provide clear guidance and expectations for state partners in recruiting new teachers and in supporting participating teachers.

¹⁵ Assuming there are presenters at each training next year.

- Consider utilizing a standing schedule (e.g., the first Tuesday of every month) for partner update calls. Assess the purpose and outcomes of meetings on an ongoing basis to determine whether other means of communication (e.g., email, newsletters, small-group meetings, etc.) could sufficiently replace monthly telephone meetings.
- Project leadership may want to consider how to address other project staff's (i.e., research/content and technology) concerns with lack of clarity on roles, responsibilities, and expectations. With some recent staff turnover and bringing on of new staff it will be important to ensure the work teams have a common vision, detailed project plan, and timeline to complete the tasks outlined in the proposal.

Appendix A: Spring 2017 ELM Cohort I Survey

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

ELM Module Implementation

How many ELM modules did you fully implement this school year?

- ☐ None
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6

If **None** is selected, respondent receives the question below, and then skips to **Organizational and Administrator Support** Q11 – Q14.

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

If **1, 2, 3, 4, or 5** is selected by the respondent to the question “How many ELM modules did you fully implement this school year?” they receive the question below.

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

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

	Not at all	To a slight extent	To a moderate extent	To a great extent
Enhanced Learning Map Document	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Teacher Notes (a synopsis of relevant research with links to other materials in the unit)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Teacher Notes video (new in January 2017)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Instructional Activity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Student Activity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Student Activity in Solution Guide	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Instructional Activity Handout	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Instructional Activity Supplement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Did you complete a feedback survey for every module you taught and all materials you used?

- ☐ Yes
- ☐ No

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

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.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
provided me with opportunities to share with my colleagues information about the ELM project.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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 modules.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ELM project staff to support my implementation of the ELM modules.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

What additional information/guidance would you have liked to support your implementation the ELM modules?

For respondents that selected **None** to earlier question of “How many ELM modules did you fully implement this school year?” they are skipped to end of survey.

Use of Enhanced Learning Maps and Impact on Instructional Practice

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.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
address gaps in students' understandings.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
identify students' misconceptions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
help students reach their learning targets.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
work with struggling learners.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
provide differentiated instruction to my students.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
personalize learning that was appropriate for students at different points in the learning pathways.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
communicate students' progress to parents.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
identify where my students are at in their learning and what they should learn next.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
provide my students task-specific feedback that helps them fill in gaps in their knowledge.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
adjust my instructional practice to keep my students moving towards their learning goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
my ability to make decisions about individual students' needs has changed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have more data available to me to provide personalized instruction for my students.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
my use of questioning strategies to elicit evidence of student thinking has changed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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.

Formative Assessment and Personalized Learning

How has your understanding of formative assessment changed?

How has your ability to provide personalized instruction changed?

Display This Question:

If To which ELM content area are you assigned? **Mathematics** Is Selected

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	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Facilitating mathematical discourse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Giving and evaluating explanations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Appraising unexpected claims, solutions, and methods	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Choosing and using representations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Examining correspondences among representations and solutions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Choosing and using definitions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Interpreting and responding to students' ideas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix B: Spring 2017 ELM Cohort I Survey Open-ended Responses

Cohort 1 participants were invited to respond to an online survey in spring 2017. Responses to each of the open-ended questions, organized by theme, are presented in full in Table B1-B4. Participants often provided comments that fit into more than one category.

Table B1. Open-Ended Evaluation Item: Use of ELM (n = 21)¹⁶

Theme	Comments
Creating individual paths (n = 6)	<ul style="list-style-type: none"> I use it for my Individual learning plans for my students. I have used it for my teacher assistant to use as a guide as they work with the students. (ELA) I use it for my Individual learning plans for my students and when I am speaking to the students' parents about the gaps in their learning. (ELA) I teach in a resource setting I have used the Learning Maps for individual student plans. I am able to make note of where the student needs to be and where they are now then show a path of what they need to master to get there. (Math) Yes! My students begin each unit by gluing a printed copy of the Learning Map covering the unit into their math notebook. They end the unit by highlighting the nodes they are confident they have become proficient with. (Math) I have used the maps to personalize learning, especially during small group rotations. Students are able to use the maps to choose the appropriate next steps for their learning. (Math) I teach in a resource setting I have used the Learning Maps for individual student plans. I am able to make note of where the student needs to be and where they are now then show a path of what they need to master to get there. (Math)
Specific materials used (n = 6)	<ul style="list-style-type: none"> Some of my students were having trouble with fractions. I did the fractions learning activities with them. I feel like it helped their conceptual view of fractions. Some of my students were having trouble with multiplying whole numbers. I liked how one of the lessons had the boxes so the students could see how we were decomposing the numbers to make it easier to multiply the numbers. (Math) I have used to student examples and the teacher guiding questions. I have also used the teacher notes. (Math) I used the ELM volume unit to teach volume this year. I loved the concrete aspects of this unit. I also used the division summer break game to enhance our division practice. (Math) Yes...I implemented two lessons. What I like most is the premade handouts for students and especially the guiding questions. They helped us in in class discussions and I even used them on Canvas as a discussion topic. (Math) I have implemented the Instructional Activities and found that after reading the Teacher Notes and implementing the Activities students seemed to have

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

Theme	Comments
	<p>a better understanding of the learning targets compared to how I previously taught the modules using the text book resources. (Math)</p> <ul style="list-style-type: none"> Enhanced Learning Maps was used to do the Piggy Bank Activity. I also co-planned with the remedial teacher to talk about learning goals for her students. (Math)
Identifying and remedying learning gaps (n = 5)	<ul style="list-style-type: none"> I used it extensively with my Tier 2 students. I found it quite useful in identifying their learning gaps. Although the student activities were helpful, many were too long to be practical in our 30-minute time period. (ELA) When I am speaking to the students' parents about the gaps in their learning. (ELA) I used the Learning Map software to help pinpoint where one of my struggling learners was having a break down in understanding. It helped to have a visual of where he may have missed learning some of the learning targets. It also helped to see a path for how he could get back on track with his learning. (Math) When working with struggling learners I used the learning maps to guide my questioning and teaching strategies. (Math) I have used it to work with small groups of struggling students. I was able to take these students back to where they were in the process of adding and subtracting fractions as well as with multiplication and division. (Math)
Identifying requisite skills (n = 3)	<ul style="list-style-type: none"> We have also started using the maps to breakdown prerequisite skills (like adding and subtracting fractions) to create assessments and make sure students have the background knowledge they need to be successful with grade level skills. (Math) Before starting a unit, I have consulted the Map to see what information my students should already have in order to understand that topic. I have also used it to show students their progress. (Math) I have used it to work with small groups of struggling students. I was able to take these students back to where they were in the process of adding and subtracting fractions as well as with multiplication and division. (Math)
Curriculum supplement (n = 3)	<ul style="list-style-type: none"> I used the units to supplement my ELA curriculum. (ELA) I have used ELM this year to support my curriculum lessons. I would teach a lesson, then use the Map to support it. I taught main idea, then used the Map to teach supporting details, etc. I feel like doing so allowed me to teach the lessons deeper. (ELA) I have been using the lessons to supplement what I was already doing in my class and in other instances replacing some of the textbook lessons. In both cases using the student activity guide to assess student understanding. (Math)
Curriculum mapping (n = 2)	<ul style="list-style-type: none"> Curriculum mapping for our grade level. I found different ways to present material to my struggling students. (ELA) I am expected to cover two grade levels of standards in one year of math in my charter school for highly gifted. By using a Learning Map, I am able to map the standards from multiple grade levels that I want to include in a unit and see how they work together for a cohesive plan. (Math)
Other (n = 8)	<ul style="list-style-type: none"> I have used the examples and questioning from the modules as we progressed throughout the year with other reading texts. (ELA) Yes. The only example I can give would be from the ONE lesson I was able to implement. (ELA) I've used the ELM in my whole group instruction. Which has its own positives and negatives because most of my students struggled in that area,

Theme	Comments
	<p>and having a different way to teach the lesson helped further their understanding. The negative was my class size is so large that it took a lot of time to make sure I was getting to every student. (ELA)</p> <ul style="list-style-type: none"> • I have used it for my teacher assistant to use as a guide as they work with the students. I have used it to reteach something that I have not communicated well to the group, when the students seem lost or confused I use it to back up to their understanding level and then proceed from there till they comprehend the new information they are learning. I have used it to teach from, the 6 were not enough so I have made up my own based on the map and the nodes. I have reinvented it to fit into my teaching year even though it is not completed like that, I found that it could be used to enhance my students learning...I just had to make it useful for me. I made it my own. (ELA) • I used some of the units during our intervention time to teach below level students. I also used the units to teach my entire class. (ELA) • My students use the maps in their portfolios when providing evidence of proficiency in standards. I have used the maps in whole group instruction when outlining KUD's for my students. (Math) • Some of my students were having trouble with fractions. I did the fractions learning activities with them. I feel like it helped their conceptual view of fractions. Some of my students were having trouble with multiplying whole numbers. I liked how one of the lessons had the boxes so the students could see how we were decomposing the numbers to make it easier to multiply the numbers. (Math) • When working with struggling learners I used the learning maps to guide my questioning and teaching strategies. (Math)

Table B2. Open-Ended Evaluation Item: Changes in Student Learning (n = 20)¹⁷

Theme	Comments
Greater student engagement (n = 8)	<ul style="list-style-type: none"> • Students liked the activities and were therefore more engaged in learning. Students liked the feeling of ownership the learning maps afforded them and as a result, I felt they gave better effort. I saw much growth in my lower Tier 2 students with these materials versus the materials from our basal series (as compared to previous years). (ELA) • What I've noticed is that overall, students were engaged and learned something through the lessons. They were really excited to take a break from curricular activities and do something new, but require the same or more critical thinking. The questioning for further understanding were great to have with students. It was really powerful to gain some more rapport with the students while hearing their reasoning to their responses. (ELA) • Students really enjoyed the geometry unit. The questions were great...also I coupled it with using geogebra to create a project of stained glass and ...the kids were so excited. I heard comments like..." I hate geometry, but I like this." "Can we do this all the time?" "Oh wow, we can blog the answers to these questions!" (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
	<ul style="list-style-type: none"> • Students are asking more questions. (Math) • My students have taken ownership of their own learning objectives. By having a Learning Map in their notebook, they are able to see what the 'end goal' is for each unit. They can assess their mastery prior to taking a final test. (Math) • Students like the idea of choice and different paths. Some of my students would try different strategies, just to see if they could learn something new on the map. Students really pushed themselves to master another concept, especially when it tied directly between the map and IXL (an online math program). (Math) • The Learning Map helped one of my struggling learners see that there are multiple pathways to learning the learning target. This was helpful for this student to see that it is ok for him to learn the topics in a different route or order than some of his peers. (Math) • Students feel more confident. Students experience successes. (Math)
Better understanding (n = 7)	<ul style="list-style-type: none"> • Students gain a deeper understanding from the resources because of the variety of hands-on activities. (Math) • I noticed huge changes in the volume unit results. Students had a better foundational understanding of volume than they have in past years. I also noticed the division activity pages focused on fact families and interpreting various aspects of the division word problem. In the past I, have skipped over these skills but I was reminded of the importance of addressing the underpinnings in this manner. (Math) • I observed students grasping a better understanding of the lessons. (ELA) • I feel that my explanations were strong, and the students were able to understand the material better enhancing their scores on our state tests. (Math) • In the lessons I used, I think the students have a deeper conceptual understanding of the concepts than in previous years. (Math) • I have seen the students feel more confident in their understanding, more able to ask questions to get clarity, more in control of their learning, the parents are involved and can understand exactly what to help their child with, there is less of an invisible wall between school and home, it has broken it down into understandable chunks for my students and my teacher assistants. The students' retention is greater and they can transfer their learning into other areas making learning meaningful. (Math) • Students are more motivated to learn because of the structure of the activities and the context of the learning. (Math)
Identifying gaps improves instruction (n = 4)	<ul style="list-style-type: none"> • Sometimes the students learn in small groups and whole groups but when individuals miss the information or miss the opportunity to be at school as is the case here above the Arctic Circle, -40 & -50 below and dark.... it has given me the opportunity to find where the student missed the connections in their learning and isolate the area then I can reteach it with the assistance of a teacher's aide and reinforce with individual work and the students catch up with what they missed and are able to continue with success. We have a lot of absent students and this has been a great tool to quickly get them back into the level of understand so they are not left behind or fall through the cracks. But I had to individualize it to fit my students I got a little creative... (ELA) • It has helped me plan instruction because I am able to identify gaps or go back easily if they are missing any prerequisite information. (Math)

Theme	Comments
	<ul style="list-style-type: none"> The Maps are helping us to create a more systematic approach to identifying gaps and grouping students for review/re-teaching based on similar misconceptions and misunderstandings. (Math) I am able to find where they are struggling based on how they are telling me how they are solving problems. (Math)
Other (n = 5)	<ul style="list-style-type: none"> The specific lessons were easy to incorporate again later to help students in their progression toward mastery of the skill when it wasn't obtained the first time through. (ELA) Students begin to think in different ways. Students use prior knowledge to acquire new skills. (ELA) I have noticed that I may have never taught some of the standards deep enough in the past. I loved the way the lessons release the responsibility to the students. (ELA) The examples of student learning are listed above. (Math) In using the Enhanced Learning Maps, I was excited to have students use it as a checklist of their learning goals. I was in a new position and, as the school year progressed, it was evident that I was not able to attend as many math meetings to make this possible. (Math)

Table B3. Open-Ended Evaluation Item: Formative Assessment (n = 18)

Theme	Comments
Changed use of formative assessment (n = 8)	<ul style="list-style-type: none"> It has given me new ideas and strategies to try and think about as I continue planning lessons and differentiating instruction. I will use it again next year. (ELA) I'm now using formative assessment more diligently than I have in the past. I've been using it during transitions and midway through lessons to see how I need to pace my teaching. (ELA) Greatly. I use formative assessment with every lesson, even if it is a thumbs up for understanding. (ELA) I am able to use an ongoing assessment system that allows me to change my teaching based on the information I gain from the lessons in the unit. (ELA) I've been participating in and leading training that involve using formative assessment as an ongoing part of your instruction for years - yet Enhanced Learning Maps has allowed me to formalize the use of formative assessment. I am now able to easily assess where a student has 'gaps' in their learning - I have printed a detailed map for just one topic and used that map while making informal assessments of students. When I see struggles I can look 'up' on the map and when I see a need for enrichment I can look 'down' on the map. ELM has made formative assessment easier! (Math) I have a stronger concept of how students react to what I am asking of them. I am more aware of how I ask my questions on the formative assessments. (Math) Our formative assessment has been more focused and complete - truly assessing all parts of the concepts. We have been able to identify skills that are important that we were not specifically assessing. (Math) I think that doing formative assessment daily or every other day is really important. This way if students are struggling, it is better to help them sooner than later. (Math)

Theme	Comments
It has not changed understanding/already had an understanding (n = 6)	<ul style="list-style-type: none"> • My understanding of formative assessment was confirmed by the ELM training. However, I gained understanding of interim and summative assessment from Dr. Margaret Heritage's training session. (Math) • My building was already very in tune with formative assessments so I didn't see a huge change in how I approached formative assessments. (Math) • I believe I came into this project with a very high understanding of formative assessment. What has changed, is the amount of resources I have to effectively use formative assessment! (Math) • It has not changed. I was very knowledgeable previous to training. (Math) • It has not changed a great deal, as I feel I had a good understanding of it before this project. I use formative assessment on a routine basis throughout daily instruction. (ELA) • No. (ELA)
Clarified the purpose or use of formative assessment (n = 3)	<ul style="list-style-type: none"> • Formative assessment should be used in multiple formats, and each student should be able to show their knowledge in different modes. (Math) • My understanding has become clearer about filling in gaps rather than re-teaching whole units, etc. (Math) • My understanding used to be that formative assessment only happened at the beginning of a unit. Now, I understand it happens throughout the unit to check for understanding as we go. (Math)
Other (n = 1)	<ul style="list-style-type: none"> • Greatly. I do not want to teach without this tool. Thank you. (ELA)

Table B4. Open-Ended Evaluation Item: Personalized Instruction (n = 19)

Theme	Comments
ELM is a useful tool for personalized instruction (n = 5)	<ul style="list-style-type: none"> • Absolutely. The ELM has allowed me to see which students are struggling and how I can better help them. They may not understand one concept, so I would go back to the nodule before that one and teach that. It was really helpful building those steps to allow for better understanding. (ELA) • I am now able to easily assess where a student has 'gaps' in their learning. I have printed a detailed map for just one topic and used that map while making informal assessments of students. When I see struggles I can look 'up' on the map and when I see a need for enrichment I can look 'down' on the map. (Math) • Improved....in the sense that I can look at ELM and see what kids are missing and fill in the gaps easier. (Math) • Having the MAPS software allows me to easily have lessons to teach my students that are struggling. (Math) • I feel that the units helped me to identify strengths and weaknesses in my students. It has also helped me to better understand where my students are struggling and what I can do to help them be more successful. (Math)
ELM is a useful tool for personalized instruction (n = 5)	<ul style="list-style-type: none"> • I have always used personalized instruction with my students, but the learning maps brought a new dimension to the table because the students were able to be a part of the "trace back" and I feel this empowered them. (ELA) • Teaching multi-grade levels is a challenge due to time constraints in the day, most students get one teacher per grade, here we have one teacher for 3 grade levels AND all the differentiation in each of those grades so it is more intense and challenging to teach in multi-grades. I found that this tool has been a great asset to my teaching because it goes across grade levels and goes directly to the "what's missing" so I can include that in my instruction

Theme	Comments
	<p>for every student. This has been a great opportunity to use in the multi-grade level situation that I am currently teaching, and the remote isolated location my school is located in. The students miss school, families have harsh lives, and limited resources available to them. This has been dramatically effective in keeping my students engaged, and being able to understand the concepts better because no one is left out anymore. In the past students that have missed a lot of school time, got left behind and were confused when they returned, had to struggle to “catch up” I could see the concern and frustration in their faces. The model (even though I used it uniquely for my circumstances) made the transition of absences seamless. They were given instruction based on their own individual needs rather than on missed “work assignments in class.” Also, those that were ready to go on and be more progressive in their leaning, were allowed to move at their own pace with this model. I have been able to basically individualize and differentiate instruction for each of my students. This has great possibility for the rural isolated villages in bush Alaska. (ELA)</p> <ul style="list-style-type: none"> • The map is a useful tool to help provide students with personalized instruction. The map has increased my ability to implement personalized instruction. (Math) • These lessons added to my toolbox of activities for personalized instruction. I think the misconceptions are helpful. (Math) • Being in a special education setting I write individual education plans and am accustomed to personalized instruction. The learning map software has made it easier to see where they need to be and a direct path to get there. (Math)
Examples of use (n = 3)	<ul style="list-style-type: none"> • Personalized instruction happened in assigning websites (TenMarks, Prodigy, Frontrow, etc.) that aligned with the domain I was using for instruction. (Math) • I am able provide more hands-on activities which appeals to many students. (Math) • I was able to teach the same concept, but have several different avenues to do it. (Math)
Other (n = 6)	<ul style="list-style-type: none"> • I feel this gives me another tool to use with students and planning instruction for them. It is a nice guide to know what to use to back up and go onto with. (ELA) • I feel that I’m taking time for every student, which in turn means that I’m getting something from each student in return. (ELA) • No. (ELA) • The maps help me to know all the skills that are needed for mastery of a standard. I can better track students individual progress. Also, the question in the lessons help guide me when working one on one with students. I get a better picture of their depth of understanding. (Math) • I am able to use the maps to personalize instruction, not just to the standard, but to each component of the standard, including foundations and extensions. Students are not only able to go farther, but deeper. I am able to help every child move forward while insuring there are no holes in instruction. (Math) • I have the resources readily available to personalize the instruction. Knew how to personalize previous to training. (Math)

Appendix C: Summer 2017 Training Survey

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 ☑

Part I: Evaluation of Training

	N/A	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Facilitator Quality						
The facilitators were knowledgeable about the subject matter.	–	☐	☐	◀	▶	▲
The facilitators encouraged questions and participation.	–	☐	☐	◀	▶	▲
The facilitators had good presentation skills.	–	☐	☐	◀	▶	▲
The facilitators included a variety of learning activities.	–	☐	☐	◀	▶	▲
Materials						
Materials were culturally sensitive (free from ethnic, gender, or class biases).	–	☐	☐	◀	▶	▲
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.	–	☐	☐	◀	▶	▲
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.	–	☐	☐	◀	▶	▲
Prior to attending this training, I was already knowledgeable about the academic content taught to children that is modeled in the map.	–	☐	☐	◀	▶	▲

	N/A	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Outcomes						
The training provided me with information resources that I can access for future use.	–	<input type="checkbox"/>	<input type="checkbox"/>	◀	▶	▲
The training increased my knowledge of how to use the learning map resources.	–	<input type="checkbox"/>	<input type="checkbox"/>	◀	▶	▲
The knowledge I gained from examining the learning map resources can be incorporated into my teaching.	–	<input type="checkbox"/>	<input type="checkbox"/>	◀	▶	▲
I will incorporate the use of learning map resources into my teaching.	–	<input type="checkbox"/>	<input type="checkbox"/>	◀	▶	▲
The training increased my knowledge in the use of learning map resources for formative assessment.	–	<input type="checkbox"/>	<input type="checkbox"/>	◀	▶	▲
The knowledge that I gained on use of learning map resources for formative assessment can be incorporated into my teaching.	–	<input type="checkbox"/>	<input type="checkbox"/>	◀	▶	▲
I will incorporate the use of learning map resources for formative assessment into my teaching.	–	<input type="checkbox"/>	<input type="checkbox"/>	◀	▶	▲
The training met my expectations.	–	<input type="checkbox"/>	<input type="checkbox"/>	◀	▶	▲
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).	–	<input type="checkbox"/>	<input type="checkbox"/>	◀	▶	▲
Overall, the information provided was useful (i.e., applicable to my teaching responsibilities).	–	<input type="checkbox"/>	<input type="checkbox"/>	◀	▶	▲
Overall, the information and activities were relevant (i.e., timely, and worth the time and effort)?	–	<input type="checkbox"/>	<input type="checkbox"/>	◀	▶	▲

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.	–	<input type="checkbox"/>	<input type="checkbox"/>	◀	▶	▲
I found the ELM software unnecessarily complex.	–	<input type="checkbox"/>	<input type="checkbox"/>	◀	▶	▲
I thought the ELM software was easy to use.	–	<input type="checkbox"/>	<input type="checkbox"/>	◀	▶	▲
I think I would need the support of a technical person to be able to use the ELM software.	–	<input type="checkbox"/>	<input type="checkbox"/>	◀	▶	▲
I found the various functions in the ELM software to be well integrated.	–	<input type="checkbox"/>	<input type="checkbox"/>	◀	▶	▲
I thought there was too much inconsistency in the ELM software.	–	<input type="checkbox"/>	<input type="checkbox"/>	◀	▶	▲
I would imagine that most people would learn to use the ELM software very quickly.	–	<input type="checkbox"/>	<input type="checkbox"/>	◀	▶	▲

I found the ELM software very cumbersome to use.	-	<input type="checkbox"/>	<input type="checkbox"/>	◀	▶	▲
I felt very confident using the ELM software.	-	<input type="checkbox"/>	<input type="checkbox"/>	◀	▶	▲
I needed to learn a lot of things before I could get going with the ELM system.	-	<input type="checkbox"/>	<input type="checkbox"/>	◀	▶	▲



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 D: Summer 2017 Training Survey Open-ended Responses

Cohort 2 and returning Cohort 1 participants who attended the Summer 2017 training responded to a survey at the conclusion of the training. Responses to each of the open-ended questions, organized by theme, are presented in full in Table D1-D4. Participants often provided comments that fit into more than one category.

Table D1. Open-Ended Evaluation Item: Most Helpful Aspect (n = 64)¹⁸

Theme	Comments
Getting time to use the software (n = 16)	<ul style="list-style-type: none"> • Time to explore the updates in the software. • It was helpful to have time to interact with the software as well as time to interact/collaborate with other math colleagues! • I really enjoyed the time to work with the software while here. • Hands on opportunities with software. • Practice working with the software on specific tasks. Would love to have had more time and practice with that. • Working with software. • Having time to “play” on the website and figure stuff out. • Getting time to work with the software in order to be comfortable with its use. • Getting time to work through the mapping software. • As a Cohort I member, I enjoyed having more time to work in the maps. • Hands-on practice of maps. • Time to play with the ELM was beneficial. • More time to play with the system. • Being able to use and dig into the software during training. • Going through the software. • Having time to explore the PDF activities
ELM Materials (n = 16)	<ul style="list-style-type: none"> • Math concepts. • Standards that are connected to other grades, either lower or higher. • Access to research based methods for math - I am new to teaching math. • Resources are well researched. Loved this! • The resources are of HIGH quality and meet the standards at a much deeper level than my district resources. • The learning maps and easy to understand standards for all grade levels. • Teaching maps and resources. • MTSS [multi-tiered support system] support resources • Also, the videos will be helpful throughout the year. • Handouts. • Being able to individualize maps for certain students. I teach special ed, so this aspect is by far the best thing for me! • The whole thing! I am so excited to begin implementing these units! My grade level differentiates our classes so this will be SO helpful to use!

¹⁸ The frequencies for each of the themes add up to greater than 64 because some responses included comments that were classified into more than one theme.

Theme	Comments
	<ul style="list-style-type: none"> • The maps will allow me to have a better understanding of how the standards flow from grade to grade. As an instructional coach, I need to know all the standards. • Being able to go back and find gaps for students and then fill them. • Being able to tailor my teaching to individual students through this program. Teaching students who are behind, I have had difficulty finding the gaps in their learning. With this project, I feel I can better reach these students. • Visual of the maps to help make connections between standards and grade levels.
Trainings (n = 14)	<ul style="list-style-type: none"> • The activities on Thursday really helped me to improve my skills in learning how to use the software. • The support from learning the software. • How to use the mapping software. • Handouts, question/answer sessions, hands on opportunities with software. • I found the training very informative. • Learning software usage. • The learning maps and mapping of standards. • Professional topics. • Training on the software. How to locate resources. • Learning how to navigate the software. • ELM software tutorial. • In person training Q and A. • Teaching maps and resources. • Modeling the tools being used.
Karen Karp (n = 11)	<ul style="list-style-type: none"> • Loved Karen Karp! • Margaret Heritage and Karen Karp grounding the work that the ELM Maps sets out to complete. I cannot wait to share this info with others. • I love having Karen Karp present. AMAZING! • Karen Karp's presentation. • Karen Karp! Amazing! • Formative assessment presentation, Karen Karp! • Formative assessment. • Karen Karp was amazing!! • Karen Karp presentation! • Karen Karp's presentation was fabulous! • Speakers (Karp and Heritage).
Collaboration/Networking time (n = 7)	<ul style="list-style-type: none"> • It was helpful to have time to interact with the software as well as time to interact/collaborate with other math colleagues! • Collaboration and conversations with others in the Cohort 1 group. • Collaboration of teachers from a variety of teaching assignments. • The ability to collaborate with others. • Collaborative with other teachers in my content area and grade level. • Meeting with other teachers and being able to discuss. • Opportunity to collaborate and connect with other educators!! Reflections and sharing was huge!
ELM Staff (n = 6)	<ul style="list-style-type: none"> • ELM staff were easily accessible to answer questions and provide help. • The expertise of the ELM staff. • Having tech support in each session.

Theme	Comments
	<ul style="list-style-type: none"> • All ELM staff was helpful as well as understanding in the intro of the maps and software. • ELM staff. • Helpful staff/leaders.
Speakers (n = 6)	<ul style="list-style-type: none"> • Many speakers who were very well trained. • Quality speakers. • Margaret Heritage and Karen Karp grounding the work that the ELM Maps sets out to complete. I cannot wait to share this information with others. • Presenters were knowledgeable and presented in a friendly way to people not familiar with the system. • Speakers (Karp and Heritage). • Margaret Heritage!!
Panel discussion (n = 6)	<ul style="list-style-type: none"> • Panel was great. • I especially liked the feedback from the panel and other Cohort I participants. • Day 3: Integration look ahead panel. • Panel question/answer session. • Panel discussion. • Panel discussion was great and focus groups!
Hearing from Cohort I (n = 5)	<ul style="list-style-type: none"> • Hearing how Cohort I members implemented the lessons this last school year. • Working with someone from Cohort I. • I especially liked the feedback from the panel and other Cohort I participants. • Collaboration and conversations with others in the Cohort I group. • The Cohort I discussion breakout session.
Background information (n = 4)	<ul style="list-style-type: none"> • Being informed about the process of how the project began and where it is now. • Building background knowledge of the project. • Margaret Heritage and Karen Karp grounding the work that the ELM Maps sets out to complete. • I appreciate all the background knowledge that we were given in regards to formative assessments.
Other (n = 8)	<ul style="list-style-type: none"> • Formative assessment. • Research connection. • The changes made to the software were amazing. • Whole group and specialized groups (math/ELA) breakouts. • FREE happy hour after full days of training. • I loved that the software component was preceded by instruction on/ information about solid teaching strategies. • The software seems manageable and also the feedback button seems useful and well used. • The connections between the learning targets.

Table D2. Open-Ended Evaluation Item: Least Helpful Aspect (n = 41)

Theme	Comments
Classroom assessment presentation (n = 12)	<ul style="list-style-type: none">• Assessment presentation by Bruce Frey.• Assessment 101 lecture.• Classroom assessment training was not useful.• Classroom assessment practices.• Bruce Frey - assessment. Bloom's.• Basics of classroom assessment.• Did not find very much validity in Margaret Heritage or Bruce Frey's presentations.• I did not find the presentation on assessment to be necessary to my understanding of ELM. I would have preferred to have the opportunity to watch Karen Karp.• Wednesday afternoon - Laurie Winter and Bruce Frey...While they were good presenters, it was nothing that helped me learn or get ready for learning about the ELM. I think just a morning session on formative and other assessment would be sufficient.• Bruce Frey's presentation. I felt like I was sitting in my assessments in college and I did not like it any better this time.• The classroom assessment session was difficult to follow.• Classroom assessment breakout session was not informative.
Specific program components (n = 12)	<ul style="list-style-type: none">• Walk through of new software (I learn by doing, not listening).• There was a lot of repetition on the second day that made it kind of boring.• Panel was good, but when teachers started to talk about their individual experiences, it became boring.• Some of the speakers talked about what most of us already knew.• Lesson (topic/unit) planning time - (speaker on Wednesday) not ready for it yet.• That ELA did not have a national speaker on the topic.• Repetition of many of the materials.• Learning how to build my own personalized maps. Not sure how to choose what to add or not add.• Not having enough time to leave with an "official" map to use at the start of the school year.• A lot of time was going over the same thing.• Perhaps for breakout sessions, we could have a few options and choose.• We need strong professional development presenters for ELA as math had this year.
Diagnostic/locator tool (n = 6)	<ul style="list-style-type: none">• Diagnostic tool was confusing/ not functioning correctly.• Confusion about the pretest/posttest implementation - though I understood this was new and just put up a few weeks ago.• Presentation on diagnostic tool - since it is not ready it was more confusing and was disengaging.• I wish the learning tool was further along. I am excited by it. I thought Chris did a good job dealing with bugs.• The locator tool training was not needed as it is not ready to implement.• Instructional section on the locator tool, mainly because of its infancy.
Nothing (n = 5)	<ul style="list-style-type: none">• Nothing!• None. Very directly aligned to content.• Nothing.

Theme	Comments
	<ul style="list-style-type: none"> • Nothing. • Loved it all. No wasted time.
More lessons needed (n = 4)	<ul style="list-style-type: none"> • Instructional resources for ELA. • Instructional resources for Cohort 2 ELA. • I hope to see more 4th -5th ELA lessons soon. • I felt it was geared more toward the upper grades not primary (2nd) in math at least.
Other (n = 2)	<ul style="list-style-type: none"> • Not having the curriculum from our own schools with us. • Support of own research to validate what I have discovered before and not had the confidence.

Table D3. Open-Ended Evaluation Item: I learned (n = 60)¹⁹

Theme	Comments
Software and its uses (n = 33)	<ul style="list-style-type: none"> • How to navigate the ELM map and multiple uses for the map. • How to use the map with students. How to print the map. How to add and take away nodes. • I learned ways to differentiate more intentionally to meet the needs of my students using the map! • How I can create a map for each student to better individually cater their learning. • How great maps are going to be when planning! • Each standard can be added to - both forward and backward - to help me better prepare my lessons – group wise or individualize. • How to use the maps to have more targeted interventions. • How to make maps for my class and individuals. • How to use the software better and navigate the site. • All about ELM and how to use the site and software. • How to better incorporate nodes and node maps into instruction. • How to use the map in my classroom with my intervention students. • Software. Implementation. • How to use the system, nodes parent and child. How to use the ELM with the tools my district already has (MAPS [Missouri Assessment Program]). • ELM mapping software, and resources. I have loved how you have added pre and post learning for the units. • How to use a learning map to help focus my teaching. • How to use the software, resources, and feedback survey. • How to use the interface and what purpose it uses. • From the panel discussion, how truly powerful the nodes can be to student learning! Very excited to utilize the map to better meet the needs of students! • Better use of the software tool. • How to make class list and manipulate the maps in a better way. • A lot about the standards as well as the connections between them as well as the software.

¹⁹ The frequencies for each of the themes add up to greater than 60 because some responses included comments that were classified into more than one theme.

Theme	Comments
	<ul style="list-style-type: none"> • How to use the ELM software in conjunction with formative assessment to drive student learning. • Great ideas on how to use this in my reading and writing classes this year! • How to use software. • The tabs in the ELM model, techniques to implement the maps into classrooms, and the activities set up for both 6/7 math. • How to make the maps more manageable. • What ELM is. • What ELM is all about! • What the project is all about. • A lot about the standards as well as the connections between them as well as the software. • How to use the ELM software in conjunction with formative assessment to drive student learning. • Ways to utilize maps with students (and maybe colleagues).
Instructional practices (n = 19)	<ul style="list-style-type: none"> • The valuable resources available to teach concepts. • More about “Rules that Expire” - I LOVE the upper level articles! • The way to teach students math. I learned to teach math in a whole new way. • Different math vocabulary. • So much! More and better math strategies. • Diagnostic interviews for progress monitoring. • I learned that what I have been doing is not necessarily the right way of doing it. • I feel much better after this training. I think I learned a lot more. I feel better about using it in my classroom. • More about teaching math and ways to use the ELM. • So much. Learning maps to connect to other knowledge. • From the panel discussion, how truly powerful the nodes can be to student learning! Very excited to utilize the map to better meet the needs of students! • How ELM maps help to teach prerequisite and to enrich. As an instructional facilitator, I can help teachers find specific skill deficits. • How to better understand where my students are in terms of their learning. • That I think we will be able to drill down (or up) and determine where to begin to do intervention and enrichment. • There is a lot of stuff I am doing well but also a lot to add to become a better educator. • Great ideas on how to use this in my reading and writing classes this year! I always love new ways to teach kids and ways to help my students better understand the standards! • Benefits of ELM and how to integrate into teaching. How other used ELM with their kids. • So much more about standard based teaching/learning. • How to find gaps in learning without guessing! I can use this to help teachers in our building that are struggling.

Theme	Comments
Formative assessments (n = 13)	<ul style="list-style-type: none"> • The importance of formative assessment - not assessments (Thank you Margaret). • I loved Margaret Heritage's presentation. It helped clarify formative assessments again. What a node is, what a 'parent' and 'child' are. • Formative assessment is truly amazing. • Whew, a lot! Margaret and Karen were incredible and I learned a lot from them. • I was also reassured about my instructional and formative assessment practices! • A new way to think about formative assessments. • Reinforced knowledge of formative assessment. • How to use formative assessment to place/find students' needs on map. • More about assessments and how to form them. • More in-depth details about formative assessment. • Formative assessment is truly amazing. • How to use the ELM software in conjunction with formative assessment to drive student learning. • I was also reassured about my instructional and formative assessment practices!
Updates to the software (n = 8)	<ul style="list-style-type: none"> • Updates to software that energized me to want to use the maps to guide instruction. • Updates in software. • ELM mapping software, and resources. I have loved how you have added pre and post learning for the units. • That the locator tool is amazing! I am excited to use this tool. • I feel much better after this training. I think I learned a lot more. I feel better about using in my classroom. • I am looking forward to the edits made to the software. I feel these edits have made it much more user friendly. • The new software is SO MUCH easier now!! Thank you!! • New things that have been added to the software.
General (n = 8)	<ul style="list-style-type: none"> • Loved Dr. Karp - wish all our staff could hear her speak. • That you unwrapped the standards really well. I appreciate the work. It saves me time. • That there are many amazing people with whom to collaborate. • As a Cohort 1 member, I still felt like a Cohort 2 because of the lack of knowledge I had about it this year (school). I feel I learned more this summer. • I learned just how well this can fit with my curriculum. • In greater detail, the connections between grade-level standards. • So many ideas from colleagues! "13 rules that expire." • So much. I really did not understand everything I was signing up for, but it was WONDERFUL!!

Table D4. Open-Ended Evaluation Item: Appreciations/Concerns/Suggestions (n = 56)²⁰

Theme	Comments
Thank you (n = 17)	<ul style="list-style-type: none"> • Thank you. • Thanks for treating me like I am a valuable part of this project. • Thank you for all your hard work put into making this event wonderful! • Thank you for your investment in this innovative and meaningful project. Go get it! • Amazing three days! • Thank you for your time and all of your hard work. You are all truly creative, amazing, and professional with this project. • Thank you, ELM! • Thank you! • Great opportunity - thank you!! • I appreciate all of the hard work, dedication, and time put into this project. • Thank you for putting this program together. It will be very useful. • Thanks for all you do! • Thank you for everything! I am so excited to be a part of this project! I know it will make an impact on students! • Thanks for the communication throughout the year! • Thank you again for the invite. I am enjoying using the maps. • I also appreciate being invited to be a part of this project. • Thank you so much!
Team/presenters/staff (n = 19)	<ul style="list-style-type: none"> • I thought Chris did a good job dealing with bugs. • I appreciate the responsiveness of the staff (especially tech) throughout the training • Hotel, food, helpfulness of staff was AWESOME. • The staff of ELM was very kind and accommodating. • ELM staff does a great job! • The responsiveness and hard work of the ELM staff is appreciated. • ALL involved in ELM planning are so helpful, kind, and knowledgeable about their area. • Friendly staff. • Sasha working with me. • Friendly staff! • Everyone on the team is incredibly helpful and responsive. • Lindsay was very knowledgeable. • The staff was very accommodating and looked out for all of our needs. Hotel and conference staff both! • Sasha made me feel welcome from the very beginning. • Loved Karen's presentation. • Really loved Karen Karp. • Karen Karp! • Karen Karp = AMAZING! Thank you. • I loved listening to Dr. Heritage again!

²⁰ The frequencies for each of the themes add up to greater than 56 because some responses included comments that were classified into more than one theme.

Theme	Comments
Quality of training (n = 6)	<ul style="list-style-type: none"> I really am happy with how well everything was put together and organized as well as the quality of presenters and research! Great job with planning, set-up of this training. I am excited to begin using! Great job! Love the connection to research. Everything was so well run. Research based tools/best practices. This was an INCREDIBLE workshop!! Great job!
Food (n = 5)	<ul style="list-style-type: none"> Hotel, food, helpfulness of staff was AWESOME. Best part was the food. Great snacks and food! Excellent food and accommodations. Attention to quality and great food - felt very cared about
General appreciation (n = 12)	<ul style="list-style-type: none"> I appreciate ALL the work going into this. I would be interested in helping develop lessons and would like to know more about that. The changes to the software make it much easier to use and navigate! Much better paced than last year! We had time to play around that was focused and with goal and objectives. It was wonderful to come together and share with other teachers. Greatly appreciated the compensation! I appreciated time to discuss/collaborate with Cohort 1. Please let us know dates for next year ASAP! I loved every minute of it! Loved it! Loved the video-trivia reception and outing. The second year was amazing and enjoyed the diversity of speakers, chance to talk with Cohort 1, and being able to bring a group from my district. Having collaboration time to hear other's thoughts about the ELM software was extremely helpful.
Suggestions/concerns – software (n = 8)	<ul style="list-style-type: none"> The level of complexity on the nodes to teach to colleagues is a bit concerning. The ELM information and brochure is minimal. The information needs to be more in depth enough for recruitment purposes. I sometimes think the maps are overwhelming or sometimes too cluttered. I am more linear in needs for my visuals. I am concerned about becoming overwhelmed but with practice I feel this will come easier. I am concerned about my ability to “move around” and use the program but once I get used to it, I will be fine. I plan on practicing with the software this summer. Software needs more information in lower grades. I wish there was more ELA resources/lessons ready to go. It was frustrating when we were trying to use the diagnostic tool and it was not working. It was hard to stay focused. Technology/look not yet sleek and savvy in such a computer based world.
Suggestions/concerns - presenters (n=5)	<ul style="list-style-type: none"> The presenters and information on the first day (formative assessment and Bruce Fey) could be more rigorous and cite more current research. It seemed lacking (William, Stiggins, Wiggins-McTigh, gradual release, etc.). For Cohort 1, different topics/speakers - formative assessments got repetitive. More than one math presenter.

Theme	Comments
	<ul style="list-style-type: none"> • I so wish I had a chance to hear Karen Karp! • I wish ELA had a national speaker like math.
Suggestions/concerns – other (<i>n</i> = 10)	<ul style="list-style-type: none"> • I would have liked to meet with my state partners again later in the training. Also, might be good to group by grade level or special education, etc., sometime so we could make those connections. I think making connections with other teachers for later communication was the part lacking for me. • Put grade levels on table tents or name tags; sit by grade level. • I think you need to present on the day of the software how to follow the map. You should show how to follow and read it. Just a small explanation. • Having time to look at maps with curriculum to help plan when we could incorporate the different lessons. • Would love to have the capability to share resources that I upload with others in my district who are ELM trained. I know the key to getting my district on board will be by showing them the impact this has on student data. If ELM could somehow track this, we will have greater success in getting our district on board. • I kind of wish we had more time with the Cohort I math and ELA together. • Having examples of students work or videos to see examples of implementation. • In the teacher tools, a snapshot/picture page of how ELM is being used in the classroom (folder organizing, interactive notebook, etc.), a Pinterest type page. • The banquet room was freezing! • Pictures in the mornings rather than at the end of the day.

Appendix E: Interview Protocols

ELM Project Staff Year 2 Evaluation Interview Questions

8/17/17

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. In addition, I would like to hear your reactions and reflections to findings from the Cohort 1 and Summer 2017 participant training surveys, Cohort 1 focus groups and partner interviews. 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. 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?
3. As a result of the training provided to teachers, how well prepared are they to implement the six ELM instructional units 2017-18? (Probe for whether differences between ELA and mathematics teachers.)
4. What additional supports and/or preparation do you believe would help the teachers implement the instructional units?
5. How have the ELM project staff supported the teachers' implementation of the ELM project activities in their classrooms?
6. What changes, if any, would you suggest for recruitment and selection of the third Cohort of teachers for the ELM project?
7. **Question for ELM technology staff only:** Have you been tracking the questions that have been coming in from the teachers? If yes, how are you using the data received?

External Communication/Collaboration – ELM Project Staff & Partners

8. 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 as well as various e-mail communications.
9. In what ways was input provided by the state partners and Governance Board members taken into consideration?
10. 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

11. Describe the communication and collaboration amongst the ELM project staff. (Probe for nature, frequency, and mode of communication.)
12. 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.)
13. What type of support do you need to successfully undertake your roles and responsibilities as it relates to the ELM project?

Reflections and Reactions to Surveys, Focus Groups, and Interview Findings

14. What surprised you most about the surveys (Cohort 1 spring survey, 2017 training survey), focus groups, and interview findings?
15. Based on the findings from the surveys, Cohort 1 focus groups and partner interviews, what were you most pleased about?
16. Based on the findings from the surveys, Cohort 1 focus groups and partner interviews, 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

17. What have been the successes of the ELM project to date?
18. What have been the challenges of the ELM project to date? How have the challenges been addressed?
19. What additional comments or suggestions about the implementation of the ELM project do you have?

Teacher Focus Group Protocol

June 2017

[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 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.

Warm-up Questions

1. What prompted your interest in participating in the ELM project? *(Probe: What did you hope to learn?)*

Supports and Challenges

2. To what extent did the summer training prepare you to implement the ELM instructional modules? Explain.

3. To what extent was the availability of ELM project staff via email and phone helpful as you implemented the ELM instructional models? Explain.

4. What other supports facilitated your implementation of the ELM instructional modules? Consider supports provided through state education agency, district contact, and school/building principal.

5. What challenges did you experience when you implemented the ELM instructional modules in your classroom?

6. What did you do to address these challenges?

Impact

7. How did participating in the ELM project influence how you think about teaching and student learning?

8. How did participating in the ELM project change your instructional practice (e.g., approaches to personalized learning and/or use of the learning maps for formative assessment)? *(Probe: Thinking about what you've learned over the year about formative assessment and the learning maps, please share an example where you have helped a student move along in their learning.)*

9. 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?

Implementation

10. ELM project staff had several expectations for the Cohort 1 teacher participants (e.g., attend June 2016 training in Kansas City, implement six units and provide feedback via surveys, participation in evaluation surveys). Were those expectations reasonable? Why or why not?

11. Were 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 [new in January 2017],
- Instructional Activity,
- Student Activity,
- Student Activity Solution Guide,
- Instructional Activity Handout,
- Instructional Activity Supplement)

Wrap-Up

12. Have you or will you recommend the enhanced learning maps to a colleague? Why or why not?

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

Individual/Group Interview Protocol – State Partners

June 2017

[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 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.

1. Initially when the University of Kansas was developing the proposal, why did your state decide to be a partner in the ELM project?
2. What were your expectations for participating in the project? Are those expectations being met? Why or why not?
3. ELM project staff had several expectations for the Cohort 1 teacher participants (e.g., attend June 2016 training in Kansas City, implement six units and provide feedback via surveys, participation in evaluation surveys). Were those expectations reasonable? Why or why not?
4. What additional supports do you believe would help the teachers implement the ELM modules?
5. 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.)
6. What do you see as the challenges of the project (consider both implementation and the intended outcomes)?
7. What recommendations do you have regarding the future implementation of the ELM project?
8. Is there anything else that you would like to share about your experiences (or those of the teacher participants) in the project?