Profile of an Elementary STEM Educator

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Abstract

Recent developments in initiatives, standards, and legislative agendas have led to increases in the number of STEM educators, in particular elementary STEM educators. This study investigates and reports the characteristics and credentials of this group and explores the features and characteristics of the student population within their classrooms. These criteria were analyzed over nearly a decade in efforts to identify progressions and changes in response to national demands. Data for this study was gathered from the Institute for Education Sciences (IES) School and Staffing Survey Teacher Questionnaire (SASS TQ) and documents a significant increase in the number of full-time elementary STEM educators, depicting the current profile of these educators as largely female, mid-career, and fully certified with a bachelor's degree from a traditional teacher preparation program. Trends support that this group is becoming more diversified with more seeking graduate degrees and more earning certification via alternative programming.

Keywords: STEM Education, Elementary Education, Schools and Staffing Survey Teacher Questionnaire, STEM Credentials, Professional Development, Teacher Learning, STEM Education Leadership

Introduction

For more than a decade academia, government, and industry have pushed the science-technology-engineering-mathematics (STEM) agenda to meet the critical need of preparing and expanding a U.S. STEM-proficient workforce. One major focus for the Obama administration's Educate to Innovate campaign was improving the quality of math and science teaching, further emphasized in 2013 as this administration challenged the U.S. to create a STEM teacher corps and "prepare 100,000 excellent STEM teachers by 2021" (The White House, Office of the Press Secretary, 2009, p. 1; Committee on STEM Education, 2013, p. i). The Trump administration continues this call for a "future where all Americans will have lifelong access to high-quality STEM education and the U.S. will be the global leader in STEM literacy, innovation, and employment" (Committee on STEM Education, 2018, p. v).

Integrated STEM education is an important factor to reaffirm America's competitive edge. The Next Generation Science Standards (NGSS), aligned with the Common Core State Standards in Mathematics (CCSS-M), create a roadmap for science, engineering, and mathematics integration that defines benchmarks, competencies, and educational trajectories (Gonzalez and Kuenzi, 2012; Honey, Pearson, & Schweingruber, 2014). These national standards build a common language, set a baseline for early stages of integration, and provide content and practice alignment.

The changes in national standards and increased focus on STEM disciplines have expanded the development of new instructional materials and specialized schools. Increases in STEM-centric schools provide new opportunities and specific roles for teachers (Honey et al., 2014). Given the emphasis on reform and national initiatives, there are growing STEM teacher preparatory needs for a role that is often ill-defined. In addition to strong content knowledge and content pedagogy, effective STEM teachers need an understanding of how to plan and implement integrated learning experiences (Honey et al., 2014; Kelley and Knowles, 2016; Nagdi, Leammukda, & Roehrig, 2018; NRC, 2011; Sanders, 2009; Shulman, 1986). While there has been a push and urgency to promote and improve K-12 STEM education, as a discipline or mega-discipline, there are inconsistencies and no common language to define and frame STEM education goals, outcomes, and implementation (Brown, Brown, Reardon & Merrill, 2011; Honey et al., 2014).

Challenges of Preparing Elementary STEM Educators

Success within an integrated STEM learning experience falls on the shoulders of the educators tasked with planning, implementing and assessing these experiences. To do this, STEM teachers need a focused understanding and vision of integrated STEM, yet little research defines what critical factors lead to increases in student learning, interest, and retention (Fulton and Britton, 2011; Hutchison, 2012; Nagadi et al., 2018). While this is a challenge for all, it is a greater challenge for elementary teachers who, for the most part, are generalists. Teaching STEM content is often beyond their comfort zone. According to the 2012 National Survey of Science and Mathematics Education, few elementary teachers have science or engineering undergraduate or graduate training and about one-third reported five or less years of experience teaching science (Trygstad, 2013). For many elementary teachers, science content is taught separate from science practices, counter to the inquiry-approach to instruction promoted by NGSS (NRC, 2007; Banilower, Gess-Newsome & Tippins, 2014; Chai, Teo & Lee, 2009).

An even greater lack of experience with teaching engineering sometimes leads to misconceptions that are passed onto students (Lachapelle, Hertel, San Antonio & Cunningham, 2014). The National Science Teachers Association (NSTA) asked educators what they needed to be better prepared to implement the engineering practices embedded within the NGSS. Responses to the survey called for instruction on engineering design processes and access to both exemplary engineering activities and a STEM community of practice (Long, 2018). This lack of experience and confidence in teaching science and engineering provides a shaky foundation for elementary teachers called upon to teach STEM. Some note increasing anxiety related to STEM education that may ultimately impact their students' perceptions of their own STEM abilities (Haverly, 2018).

The elementary years are a critical time to build STEM foundational understanding for children and efforts must be made to develop elementary teachers' confidence and competence in STEM content and pedagogy (Nadelson, Callahan, Pyke, Hay, Dance, & Pfiester, 2013). Professional learning experiences for elementary STEM teachers need to help these educators plan and implement instruction that effectively uses the scientific and engineering practices within NGSS (NRC, 2015). These learning experiences should also be job-embedded, reinforced over time and delivered in ways that promote content integration (Hanover Research, 2012; Bowers & Ernst, 2018).

Are teacher preparation programs providing the guidance and professional learning STEM educators need? In a recent study, six out of eight STEM educators indicated that pre-service programs were not preparing qualified STEM teachers with the skills needed to implement the required teaching and learning strategies (Nagadi, et al., 2018). Teacher professional development for STEM educators was deemed insufficient by approximately half of more than one thousand educators in the 2012 National Survey on STEM Education (Tech & Learning, 2012; IESD, 2012). While academia, government, and school districts work to define and align efforts towards meeting national, regional, and local STEM education goals, what can be learned about the current profile of an elementary STEM educator?

Research Questions

The purpose of this study was to identify the characteristics and credentials of elementary STEM educators to gain insight into the current profile of this group. Data gathered over nearly a decade allows for cross-sectional insight into changes in these criteria as they may impact teacher preparation needs. This study also analyzes nearly a decade's worth of data that characterizes student population features identifiable within elementary STEM educators' classrooms. These three research questions frame this study:

1 -- What are the characteristics of full-time elementary STEM educators and how have teacher characteristics changed over time?

2 -- What are the credentials of full-time elementary STEM educators and how have teacher-attained credentials changed over time?

3 -- What student population features and characteristics are identifiable within elementary STEM educators' classrooms and how have these criteria changed over time?

Methodology

The study methodology employed similar processes and techniques originally implemented in prior studies by the author team utilizing the Schools and Staffing Survey Teacher Questionnaire (SASS TQ) (Ernst & Williams, 2014; Ernst & Williams, 2015). The SASS TQ is a restricted access dataset that requires application to the National Center for Education Statistics (NCES). Specific investigational protocols must be submitted and approved prior to data access. The results were approved for release. The research team secured authorization for the use of this data by the NCES and Institute for Educational Sciences (IES).

The three questionnaires were developed by the NCES and the IES within the U.S. Department of Education. The objective of the SASS TQ was to collect the information necessary for a comprehensive picture of elementary and secondary education in the United States. Only data for those who self-identified as elementary educators were used in this study. The abundance of data collected by the SASS TQ permits detailed analyses of the characteristics of schools, principals, teachers, school libraries, and public school district policies. The National Teacher and Principal Survey (NTPS) is a redesign of the Schools and Staffing Survey (SASS) and many of the questions are identical. The NTPS maintains the same focus on schools, teachers, and administrators that was traditionally held by the SASS. Estimates can be produced at the national level for each target population by both the SASS TQ and NTPS TQ (Taie & Goldring, 2017).

Data were weighted using the Teacher Final Sampling Weight (TFNLWGT) variables supplied by IES for weighting the 2007-2008 SASS TQ , 2011-2012 SASS TQ and the 2015-2016 NTPS TQ data. All data presented are weighted data and weighting procedures used by IES can be found in Tourkin, Thomas, Swaim, Cox, Parmer, Jackson, Cole, and Zhang (2010); Cox, Parmer, Strizek, and Thomas (2016); and Taie and Goldring (2017). The NCES and IES require that all weighted n's be rounded to the nearest ten to assure participant anonymity. Data in tables and narrative may not add to the total n reported because of rounding requirements. Any data that did not meet NCES and IES reporting requirements were noted in the tables and the data were not presented.

Participants

Participants included in this study identified their primary teaching assignment by selecting from subject-matter codes within the areas of science, technology and engineering, and mathematics for the question, "This school year, what is your MAIN teaching assignment field at THIS school?" in the 2007-2008 SASS TQ and 2011-2012 SASS TQ. For the 2015-2016 NTPS TQ, the question, "This school year, in what subject is your MAIN teaching assignment at THIS school, that is, the subject matter in which you teach the most classes?" was used to select participants.

Teachers were further identified as elementary or secondary educators by the variable TLEV2_03 on the 2007-2008 and 2011-2012 SASS TQ. It was determined by variable TLEV_2CAT on the 2015-2016 NTPS TQ. Although the variable names were different, the question was identical across the surveys.

Variables Analyzed

Gender, Age, Teaching Experience, and Employment Status. The gender of elementary STEM education teachers was determined by the question, "Are you male or female?" Teachers' age was determined by the variable AGE_T. Teaching experience was determined by the variable TOTYREXP which was calculated as the sum of all years taught full or part-time in public and private schools. Employment status was determined by the variable FTPT. The variable names and questions were consistent across the three surveys.

Race and Ethnicity. The ethnicity and race of teachers was determined by two questions. The first was, "Are you of Hispanic or Latino origin?" The second asked, "What is your race?" Respondents were to mark one or more of the listed races to indicate what race(s) they consider themselves. Five choices were provided for race: White, Black/African-American, Asian, Native Hawaiian/Other Pacific Islander, or American Indian/Alaska Native. The racial categories listed were taken verbatim from the surveys. Respondents were allowed to make more than one selection and the percentages may not always add to 100 percent. Questions and response choices were the same across the three surveys.

Level of Education. The variable HIDEGR was used to determine the highest degree obtained by the teacher and was used as an indicator of education level. This variable considered five levels of educational degrees from Associate through Doctorate. It should be noted that HIDEGR does not take into account multiple degrees (e.g. Bachelors and Masters or double Masters), only the highest degree obtained. The variable name and response categories were the same across the three surveys.

Certification Status, Certification Route, and Placement. The question, "Which of the following describes the teaching certificate you currently hold that certifies you to teach in THIS state?" was used to identify whether or not the teachers were certified in the subject they teach. We chose to report those teachers who reported being fully certified by the state in which they were employed with no contingencies.

The question used to determine whether the certification route was alternative or through a traditional college program was, "Did you enter teaching through an alternative certification program?" An alternative program was described as a program that was designed to expedite the transition of non-teachers to a teaching career, for example, a state, district, or university alternative certification program. This question was the same across the three surveys.

Teaching placement was determined by variable TLEV2_03 on the 2007-2008 and 2011-2012 SASS TQ. It was determined by variable TLEV_2CAT on the 2015-2016 NTPS TQ. Although the variable was different, the question was identical across the survey indicating the level of students taught by teacher as either elementary or secondary.

Caseload. The variable PUPILS_D was used to determine the mean total number of students taught. PUPILS_D asked teachers how many students they teach per day in their content area. This question was consistent across the three surveys. The survey questions employed to address students with categorical disabilities and limited English proficiency are presented below. Service load was calculated by the researchers to be the sum of responses to relating to students with categorical disabilities and limited English proficiency.

The number of students with categorical disabilities was determined by responses from teachers who reported teaching students with recognized disabilities requiring an individualized education plan. The 2007-2008 and 2011-2012 SASS TQ asked, "Of all the students you teach at this school, how many have an Individualized Education Program (IEP) because they have disabilities or are special education students?" Teachers either checked none or entered an integer. From the NTPS TQ respondents were asked, "Of all the students you teach at THIS school, how many have an Individualized Education Program (IEP) because they have disabilities or are special education students?" Respondents were specifically instructed not to include students who only had a 504 plan. Teachers either checked none or entered an integer.

Likewise, the number of students identified as LEP was determined by responses from teachers who reported teaching students who did not speak English as their primary language and who had a limited ability to read, speak, write, or understand English. This number was derived from the response to the 2007-2008 and 2011-2012 SASS TQ question, "Of all the students you teach at this school, how many are of limited-English proficiency(LEP)?" Students of limited-English proficiency (LEP) are those whose native or dominant language is other than English and who have sufficient difficulty speaking, reading, writing, or understanding the English language as to deny them the opportunity to learn successfully in an English-speaking-only classroom. Teachers either checked none or entered an integer. The NTPS TQ asked the identical question, "Of all the students you teach at THIS school, how many are of limited-English proficiency (LEP) or are English-language learners (ELLs)?" Teachers either checked none or entered an integer.

Results and Discussion

The primary intent of this study was to build an understanding of the characteristics and credentials of elementary STEM educators, and the composition of the student population within their classrooms. This study also considers how these criteria have changed over time. In examining the first research question, "What are the characteristics of full-time elementary STEM educators and how have teacher characteristics changed over time?" summary statistics were tabulated to provide a cross-sectional perspective of educator gender, age, experience, status, and reported racial category. Descriptive information on these characteristics is provided in Tables 1 and 2.

This data indicates an increase in elementary STEM educators with full-time status in STEM education (Table 1). In nearly a decade, the role of an elementary STEM educator has grown in terms of full-time status. The group has increased by approximately 20,000, growing from 45,950 to 66,230 elementary STEM educators, an increase in excess of 30%. The field is stabilized in gender and age, while the group continues to be predominantly female. The number of educators with full-time status has grown by more than a third, increasing from 38,110 to 60,852.

The body of elementary STEM teachers diversified with the largest increases within the categories of Hispanic, African-American/Black, and Asian (Table 2). The percentage of Hispanic elementary STEM educators more than doubled over this 8-year time span, while an increase by about 30% was noted within the Black/African-American sub-group. A slightly larger than 500% increase was seen in the number of Asian elementary STEM teachers. While the number of elementary STEM educators in these three groups consistently increased, a small drop can be seen in the percentage of White elementary STEM educators over the same time span. The percentage of Native Hawaiian/Pacific and American Indian/Alaska Native was largely unchanged with very small representation in both groups. This data supports, overall, a trend toward greater diversity.

The second research question, "What are the credentials of full-time elementary STEM educators and how have teacher-attained credentials changed over time?" is explored through SASS TQ data gathered that provides descriptive accounts of the elementary STEM educators' highest degrees earned, certification status and career path entry. Descriptive information on the teachers'

	2007-2008 SASS TQ STEM ($n = 45,950$)	2011- 2012 SASS TQ STEM ($n = 54,660$)	2015-2016 NTPS TQ STEM ($n = 66,230$)
Male	11,800 (25.7%)	10,950 (20.0%)	13,575 (20.5%)
Female	34,110 (74.3%)	43,720 (80.0%)	52,659 (79.5%)
Mean Age	42.56	42.17	42.98
Mean Experience	15.98	14.02	13.63
Full-time Status	38,110 (82.9%)	48,110 (88.0%)	60,852 (91.9%)

Note. SASS TQ is the Schools and Staffing Survey Teacher Questionnaire. NTPS TQ is National Teacher and Principal Survey Teacher Questionnaire. All *n*'s are rounded to the nearest 10 per NCES and IES requirements. Percentages may not add up to 100 because of rounding requirements.

Table 1. Elementary STEM educator gender, age, teaching experience, and status as reported on the 2007-2008 SASS TQ, 2011-2012 SASS TQ and the 2015-2016 NTPS TQ.

	2007-2008 SASS TQ STEM ($n = 45,950$)	2011- 2012 SASS TQ STEM ($n = 54,660$)	2015-2016 NTPS TQ STEM ($n = 66,230$)
Hispanic	2,200 (4.8%)	5,360 (9.8%)	6,600 (10.0%)
White	42,400 (92.3%)	47,730 (90.2%)	57,810 (87.3%)
Black/ African-American	3,210 (7.0%)	4,710 (8.6%)	6,880 (10.4%)
Asian	300 (0.7%)	1010 (1.9%)	2,520(3.8%)
Native Hawaiian/ Other Pacific Islander	90 (0.2%)	150 (0.3%)	100 (0.1%)
American Indian/ Alaska Native	570 (1.2%)	1200 (2.%2)	950 (1.4%)

Note. SASS TQ is the Schools and Staffing Survey Teacher Questionnaire. NTPS TQ is National Teacher and Principal Survey Teacher Questionnaire. All *n's* are rounded to the nearest 10 per NCES and IES requirements. Percentages may not add to 100 because of rounding requirements.

Table 2. Elementary STEM educator self-reported racial category from the 2007-2008 SASS TQ, 2011-2012 SASS TQ and the 2015-2016 NTPS TQ.

	2007-2008 SASS TQ STEM ($n = 45{,}950$)	2011-2012 SASS TQ STEM ($n = 54{,}660$)	2015-2016 NTPS TQ STEM ($n = 66{,}230$)
Associates	180 (0.4%)	2,240 (4.1%)	1,160 (1.8%)
Bachelors	23,700 (51.6%)	19,780 (36.2%)	31,470 (47.5%)
Masters	19,190 (41.8%)	29,590 (54.1%)	26,990 (40.8%)
Educational Specialist	2,330 (5.1%)	2,900 (5.3%)	6,260 (9.5%)
Doctorate	540 (1.2%)	150 (0.3%)	350 (0.5%)

Note. SASS TQ is the Schools and Staffing Survey Teacher Questionnaire. NTPS TQ is National Teacher and Principal Survey Teacher Questionnaire. All *n's* are rounded to the nearest 10 per NCES and IES requirements. Percentages may not add to 100 because of rounding requirements.

Table 3. Elementary STEM educator highest degree reported on the 2007-2008 SASS TQ, 2011-2012 SASS TQ and the 2015-2016 NTPS TQ.

	2007-2008 SASS TQ STEM ($n = 45{,}950$)	2011- 2012 SASS TQ STEM ($n = 54{,}660$)	2015-2016 NTPS TQ STEM ($n = 66{,}230$)
Fully Certified	39,960 (87.0%)	49,580 (90.7%)	59,590 (90.0%)
Alternative Program	6,690 (14.6%)	7,130 (13.0%)	12,090 (18.3%)
Traditional Program	39,260 (85.4%)	47,533 (87.0%)	54,140 (81.7%)

Note. SASS TQ is the Schools and Staffing Survey Teacher Questionnaire. NTPS TQ is National Teacher and Principal Survey Teacher Questionnaire. All *n's* are rounded to the nearest 10 per NCES and IES requirements. Percentages may not add to 100 because of rounding requirements.

Table 4. Elementary STEM educator certification status and career path entry as reported on the 2007-2008 SASS TQ, 2011-2012 SASS TQ and the 2015-2016 NTPS TQ.

	2007-2008 SASS TQ STEM ($n = 45{,}950$)	2011- 2012 SASS TQ STEM ($n = 54{,}660$)	2015-2016 NTPS TQ STEM ($n = 66{,}230$)
Mean Number of Students	34.48	38.02	43.02
Mean Categorical (IEP)	11.76	12.74	12.58
Mean LEP/ELL	4.85	7.53	11.54
Service Load	16.61	20.27	24.12

Note. SASS TQ is the Schools and Staffing Survey Teacher Questionnaire. NTPS TQ is National Teacher and Principal Survey Teacher Questionnaire. All *n's* are rounded to the nearest 10 per NCES and IES requirements. Categorical are students with disabilities with individualized education programs. LEP is limited English proficiency. ELL is English language learner. Service Load is the sum of Categorical and LEP/ELL.

Table 5. Elementary STEM educator caseloads as reported on the 2007-2008 SASS TQ, 2011-2012 SASS TQ and the 2015-2016 NTPS TQ.

credentialing is provided in Tables 3 and 4.

The percentages of elementary STEM educators with Bachelors, Masters, and Doctorate degrees held essentially steady over the 8-year span. The greatest jump, nearly doubled to 10%, is seen in the number of elementary educators holding Education Specialist degrees between 2011-2012 and 2015-2016 (Table 3).

Certification and career path entry into elementary STEM education through traditional programming remained steady over the years of this study. Between 2011 - 2012 and 2015-2016, an increase in elementary STEM educators' certification via alternative programming can be seen, suggesting more opportunities and pathways for individuals to become elementary STEM teachers (Table 4).

The third research question, "What student population features and characteristics are identifiable within elementary STEM educators' classrooms and how have these criteria changed over time?" is explored through SASS TQ data describing elementary STEM educators' caseloads (Table 5).

This data indicates that class sizes are increasing. Along with the overall increase in student numbers comes increases in the number of students with limited English proficiency (LEP)/English language learners (ELL) and students with Individualized Education Programs (IEP). Elementary educators' responsibilities and the challenge to address varied learning needs have increased over the last eight years.

The SASS TQ data provides a profile of an elementary STEM educator's characteristics, credentials, and their changes over time. Literature has identified that elementary educators, such as the one's characterized by this research, self-report a lack of experience and confidence in teaching STEM content and practices. In addition to offering a profile of elementary STEM educators, the SASS TQ data also provides general features and attributes of the elementary STEM student population and how these have changed over time. The literature supports that students sitting within elementary STEM educators' classrooms are impacted by elementary teachers' confidence and competence in STEM content and pedagogy.

Conclusions and Implications

This study highlights numerous aspects of elementary STEM educators' credentialing, as well as several attributes compared over time. Specifically, data from the SASS TQ documents a significant increase in the number of full-time elementary STEM educators, characterizing the current profile of these educators as largely female, mid-career, and fully certified with a bachelor's degree from a traditional teacher preparation program. Trends over nearly a decade support that this group is diversifying with more seeking graduate degrees and more earning certification via alternative programming.

Summary data identifies that today's STEM educator could, on average, teach approximately 43 students, 13 who have an IEP and 12 who are LEP resulting in a total caseload of 25. The mean number of students educated by elementary STEM educators appears to be increasing over time, as are the caseloads of students with disabilities (IEP) and limited English proficiency (ELL and LEP). This increases the opportunity for elementary STEM educators to make a positive impact on the traditional learner and, more specifically, students with identifiable learning needs.

If the data continues on this trend over the next decade, the average projected service load (IEP, LEP and ELL) for an elementary STEM educator could grow to 32 students within a teaching load of 52. In response to that growing student population, there could be approximately 83,000 elementary STEM teachers, a proportional increase of 25%. With these potential increases, there will be a critical need for professional learning experiences that prepare elementary STEM educators for an increasingly unique population of learners.

There is an identifiable rise in alternative certification of elementary STEM educators paired with a proportional decrease in traditionally licensed teachers. Continuing to project this trend over the next decade suggests that the number of alternatively licensed teachers will increase by approximately 20%. If traditional teacher preparation programs fall short in their ability to prepare qualified STEM teachers, will these alternative certification pathways meet this challenge effectively?

While data indicates an increase in the number of elementary STEM educators, one-third of the more than one thousand educators surveyed for the IESD 2012 National Survey on STEM Education site a deficiency of qualified STEM education leaders (Tech & Learning, 2012; IESD, 2012). With STEM programming continuing to grow in response to national reform, coherent and consistent approaches to teacher preparatory programs are essential. Efforts must be made to support STEM teachers who see themselves as ongoing learners, open to change, collaborative and committed to long-term refinements of their teacher practice (Nagadi et al., 2018).

While academia, government, and school districts continue to define and align efforts toward meeting national, regional, and local STEM education goals, they also have a duty to provide coherent and focused professional learning experiences for STEM educators. Some states are developing state-based criteria and programming to respond to the call for more STEM-centric educational experiences and to align education efforts with industry needs. While this work seeks to provide more equitable access to learning that prepares and entices students to pursue STEM careers, many programs have not achieved their return on investment due to a lack of coordination, resources, and/or evaluation (Zinth & Goetz, 2016).

A few programs stand out. Utah's efforts have been cited by the Promising Practices in Education report as an exemplar with legislation that established the Utah STEM Action Center (Zinth & Goetz, 2016). Supported by the governor, the New York State Master Teacher Program (NYSMTP), in partnership with The State University of New York (SUNY) and Math for America, selects K-12 educators for a four-year cycle of professional learning to foster growth in STEM content knowledge and pedagogy (SUNY, 2019).

Maryland's State Department of Education (MSDE) offers an endorsement for PK-6 teachers in the area of STEM Leadership (MSDE, 2013). Pennsylvania encourages teachers to develop their STEM education skills by outlining an endorsement in Integrative STEM Education and efforts are currently underway in Virginia for a similar STEM Instructional Leadership coherent credentialing (Pennsylvania State Department of Education, 2014; Peterson, Bowers, Bowen, Egenrieder & Magliaro, 2018).

There is a growing separation between the existing profile of elementary STEM educators and the needs-driven projection of future demands. To truly meet the call for a STEM-literate K-12 student population prepared to meet workforce needs, states and local academia must provide more focused and targeted integrative STEM professional learning experiences and coherent credentialing for elementary educators.

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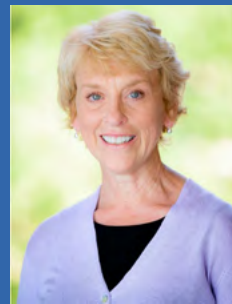

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