

A Successful Approach to Improving High School Mathematics Education:

COME ON

California's Outstanding Math
Educators' Ongoing Network

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A Successful Approach to Improving High School Mathematics Education: COME ON California's Outstanding Math Educators' Ongoing Network

Introduction

The California's Outstanding Math Educators' Ongoing Network (COME ON) initiative is a unique and innovative effort to support high school mathematics teachers in California. It serves as a living example of a successful model that addresses an issue critical to all of mathematics education K-18 -- how to sustain and strengthen those most directly responsible for improving the quality of teaching and learning of secondary mathematics.

COME ON is a statewide, curriculum-centric professional learning network. Its overall design is deliberately unlike other high school improvement efforts. It takes an original amalgamated approach rather than focusing on either a school or district level, or solely on traditional dimensions of change such as teacher enhancement, assessment or curriculum. Although centered on a specific high school instructional program—the Interactive Mathematics Program (IMP)—it builds upon and extends beyond the IMP work and its users, aiming to meet the needs of a broad range of California high school mathematics teachers, those who use the IMP materials and those who do not. COME ON provides a learning community for all interested high school mathematics teachers—offering them professional development, structures and venues for connecting with one another to discuss topics and issues related to classroom practice, as well as providing a range of leadership opportunities.

We believe our intended audiences can learn much from the COME ON effort. Funders interested in investing in mathematics education improvement at the high school level, as well as scholars studying the value and design of curriculum-focused enhancement efforts, or professional networks in secondary mathematics will find the COME ON story instructive.

We believe so for multiple reasons. First and foremost, COME ON addresses directly the long-standing questions of how to support high school mathematics teachers in reflecting upon and improving their practice, deepening their content knowledge, and providing rich

meaningful learning experience for students. Second, the initiative has a proven track record. Numerous teachers throughout the state have already benefited from its work; its contributions to these teachers are well documented and visible. Third, the COME ON model exhibits important design features that are critical to its success, and that can, in turn, be understood and replicated by others in the planning and design of future improvement enterprises. Finally, and most importantly, as a currently viable curriculum-centric professional learning network, COME ON holds even greater potential than what has been realized thus far. It is poised to serve as an ongoing and ever expanding community of teachers involved in mathematics education improvement. As such it promises to make a significant contribution to a state-wide improvement infrastructure -- one which can build the capacity of high school mathematics teachers over the long-term, and can thereby cumulatively improve the quality of high school mathematics teaching and learning throughout California.

This report provides what we think of as a “conceptual portrayal” of the COME ON initiative intended to highlight its significance and its future potential. We begin by recounting the genesis and evolution of the initiative. We then summarize the evaluation findings in terms of the value and impact of the effort, and go on to analyze the design components of the COME ON model. In the final sections, our aim is to bring a broader perspective and vision of COME ON to the reader in order to make the case for its potential contribution to state-wide mathematics education improvement.

The Genesis and Evolution of COME ON

In the late 1980s the National Council of Teachers of Mathematics (NCTM) published the Curriculum and Evaluation Standards for School Mathematics.¹ Its central message was that the teaching of mathematics in American schools needed to change at *all* grade levels in order to provide the best possible learning opportunities for *all* students to learn rigorous mathematics relevant to the 21st century. Mathematics instruction, the Standards argued, should emphasize more solving of complex problems involving multiple mathematical ideas, and less practicing of finite procedures. Mathematics should become a “pump rather than a filter,” and should meet the needs of every student, not just a select few.

As a result of the increased awareness and need for change, the NCTM Standards generated numerous efforts to realize the new vision of K-12 mathematics education emerged. The Interactive Mathematics Project (IMP) was one.

¹ National Council of Teachers of Mathematics. (1989). Curriculum and evaluation standards for school mathematics. Reston, VA: National Council of Teachers of Mathematics.

Since the inception of its predecessor over a decade ago, what is now the Interactive Mathematic Program (also called IMP) has evolved into a four-year, integrated, high school mathematics program. In contrast to traditional text-centered high school mathematics programs, IMP is problem-based and student-centered, designed for use in heterogeneous classrooms, and focused on the conceptual learning of mathematics for all students. As a result, the selection, adoption and implementation of IMP require in-depth professional development for its teachers, as well as broader awareness-building for administrators, parents, and community members about the goals and design of the program. Beginning in 1995 several state and national grants focused on supporting schools and districts across the country that were in the process of selecting or implementing IMP. An outgrowth of these efforts was the development of a national level IMP network, of which COME ON is a direct descendent.

COME ON Today

Today COME ON stands as the current embodiment of the IMP network in California. Funded in 2002 by the National Science Foundation (NSF) as a teacher retention and renewal initiative, it draws upon the expertise of veteran high school IMP mathematics teachers who provide a range of professional development opportunities to less experienced secondary mathematics teachers. More recently, through supplemental funding, COME ON has expanded its reach to include pre-service students.

Three categories of high school mathematics teachers are identified by and participate in COME ON: novices, veterans, and standards-bearers. *Novices* are teachers in their first few years of teaching, those who according to current research are most often at risk of leaving the profession. *Veterans* are teachers who have taught for a number of years. Many are looking for renewal, seeking out high-quality professional experiences, richer curriculum, and new methods of instruction and assessment to better connect a wider, more diverse range of students to the mathematics they teach. Finally, *Standards-bearers* are teachers who have participated in extensive professional development, who have taught all four years of IMP, and who have reached a certain level of expertise both in their classroom practice and in their knowledge of IMP. Often they are leaders in their own schools or district.

COME ON combines the novice and veteran groups into a single group called MIST (Mathematics Teachers Initiating Standards-based Teaching). However, as accomplished teachers of a standards-based curriculum, the standards-bearers have different needs, and therefore their own activities as the MOST (Mathematics Teachers Optimizing Standards-based Teaching) group.

The program is organized around two major sets of activities—annual summer institutes with mid-year follow up for MIST teachers, and yearly leadership retreats and other

activities tailored to MOST teachers. The summer institute courses are designed by the project leaders and many of the MOST teachers, and facilitated by MOST teachers. Originally, a larger number of these were focused on learning to teach the IMP units, but over time the range of institute offerings has expanded to include experiences for all high school mathematics teachers regardless of the instructional materials they use at their school site.

The overarching goal of all COME ON sponsored activities is to support the teaching and learning of meaningful mathematics by increasing teachers' content knowledge, supporting their implementation of the IMP materials (if applicable), building their understanding of how students learn mathematics, and expanding their repertoire of teaching strategies. In this way COME ON aims to improve the retention and renewal of all—novice, veteran and standards-bearers teachers.

Inverness Research and This Report

Inverness Research has served as the external evaluators for the COME ON project since 2002. Our evaluation focused on documenting the nature and extent of the impact of the project's work with teachers, understanding the mechanisms that enabled the work to occur effectively, and in the later years, studying the project function and design from a particular perspective -- as a curriculum-centric professional learning network for high school mathematics teachers.

Over the years we have gathered data through a variety of methods including: observing professional development offerings; interviewing MIST teachers and pre-service teachers; conducting focus groups with MOST members and veteran IMP teachers; administering surveys to both MIST and MOST teachers; and, finally, participating in project planning and leadership meetings. This data has been compiled and analyzed, and the results of our findings presented to project leaders through conversations and written evaluation reports.

Today the data we have gleaned from studying the COME ON effort provides the foundation of this report, grounding the ideas we present here in concrete evidence. We also situate our perspectives on COME ON within a broader context, namely our experience studying K-12 education improvement efforts for over three decades. We bring our knowledge in a range of dimensions: the idiosyncratic needs and challenges faced at the high school level; mathematics and science instructional materials development; the design and development of professional networks; teacher leadership development; and, systemic change and capacity-building efforts in K-12 education.

Our wide-angle lens allows us to view the COME ON initiative as something more than what was originally intended. Held up against a larger landscape of educational

improvement efforts, we expand beyond the intended results of the project to what we believe are its broadened, more provocative implications.

The Contributions of COME ON

Historically secondary mathematics is considered an isolated, often impermeable domain. High school mathematics teachers and their departments seem to exist in their own world, maintaining conservative cultures that frequently remain impervious to innovation. Neither general school reforms, nor systemic reform efforts have significantly impacted high school mathematics teaching, although the call for reform has been loud and long-standing.

Serving as an exception to this generalization is the COME ON effort. Over the past five years our evaluation has shown that COME ON has succeeded in making some important inroads into a traditionally intractable field. In the following section we describe its major contributions in order to give substance and credibility to the implications we later extrapolate from the project's record of accomplishment in this report.

- First and foremost, COME ON has achieved a **broad geographical reach**. Each year between 150 and 200 high school math teachers, representing all regions across the state of California, participated in COME ON institutes.
- COME ON provided **high quality professional development** to those teachers who participated. The MIST participants overwhelmingly rated the COME ON offerings attended as very high quality and very valuable. When asked to rate the sessions on a scale of one to five, with one being the lowest rating and five being the highest possible rating, teachers rated both the quality and the value of most of the professional development a four or five. MIST teachers named several aspects that contributed to the quality and value of the professional development offerings, including the expertise of the instructors, the culture of the learning environment, and the supportive project leadership.
- COME ON participants had the opportunity to develop **familiarity with a well designed, challenging and educative high school mathematics program, namely IMP**. MIST teachers recognized that “IMP is different and you need to be trained to use it.” Teachers appreciated being immersed in the curriculum as learners themselves. According to survey data, more than 85% of MIST teachers who took the IMP 1, 2 or 3 course rated the sessions as very useful. In addition, there were also a number of MIST participants who, for their own personal and professional growth wanted to learn more about IMP and enrolled in IMP-designated workshops even though they were not using the IMP materials in their school.

- COME ON participants at all levels **increased their mathematics content knowledge**. Many MIST teachers appreciated the opportunity to be challenged as mathematical thinkers at the COME ON institutes. Several told us how much they enjoyed focusing on their subject matter, especially compared to generic professional development offered at their school or district level. A number of teachers talked excitedly about really learning and understanding certain mathematical topics for the first time. In addition members of the MOST group also commented about the value of continuing to learn mathematics—especially adult level content that bears relevance to central secondary topics. Their inherent love of mathematics and desire to continue to expand their own mathematical knowledge was evident.
- COME On participants **increased their pedagogical content knowledge**. The project’s effectiveness in building teachers’ mathematical understanding, coupled with its strong student-centered constructivist teaching style, helped teachers understand how their students learn mathematics. For some teachers we interviewed, the COME ON professional development helped them understand the critical distinction between knowing the mathematics themselves, and being able to explain it to their students.

Our survey results indicated that 85% of the MIST teachers said that COME ON made a significant or major contribution to their understanding of how students learn mathematics, while 91% of the MOST teachers responded similarly. In addition 82% of MIST teachers responded that their COME ON experiences improved their ability to teach mathematics, and 78% of the MOST teachers agreed.

- COME ON teachers **made changes in their classroom practices**. As a result of their experience at COME ON institutes, many teachers reported shifts in their thinking about the teaching and learning of mathematics. They also indicated that they were making changes in their classroom practice accordingly. In addition, teachers indicated that they were increasingly using classroom strategies that have been associated in prior studies (i.e., NAEP) with higher student achievement.
- As a result of their participation in COME ON network activities participants **reported benefits to their students**. According to our survey data, 95% of MIST teachers reported that their students had benefited from the teachers’ participation in the COME ON Project. In addition, several teachers reported that since making certain changes in their classrooms—for example, using less direct instruction and having more student-led activities—their students exhibited better retention and deeper understanding of new mathematical concepts.
- Finally, our evaluation data suggests that COME ON is **achieving its “retention and renewal” goals** for all levels of participating teachers, including novices,

veterans and standard-bearers. 88% of the MOST cadre reported that their participation in COME ON contributed to their interest in continuing to teach. In addition 97% responded affirmatively to the question, “As a result of participation in the Project, do you feel more supported or renewed as a math teacher?”

A total of 82% of the MIST survey respondents reported their participation in the Project contributed to their interest in continuing to teach. In addition, 93% indicated that they "feel more supported or renewed as a mathematics teacher.”

Finally, in our interviews with novice teachers we learned that many experienced newfound classroom successes as they applied what they had learned through COME ON professional development in their classrooms. Their responses corroborated the idea that a sense of efficacy in the classroom weighs heavily as a positive retention factor when a new teacher is deciding whether to stay or to leave the profession.

Key Design Components of the COME ON Initiative

The contributions discussed above are important in demonstrating the successes of COME ON. Also important to understand is that these accomplishments do not occur serendipitously. Rather we have come to recognize that they are the direct result of a carefully crafted overall design. The COME ON effort is built around a set of core design components that both shape and drive its work and help ensure its effectiveness. We identify and describe these below, aiming to illuminate for funders and program designers who are interested in developing and promoting high school mathematics supports, the key architectural elements we feel account for COME ON’s efficacy.

We have characterized COME ON as a curriculum-centric professional learning network. Each of these three key ideas—curriculum-centric, professional learning, and network—is integral to a fuller appreciation of its unique design, as well as to an understanding of our re-interpretation of the goals and purposes of the project. Although in reality they are highly linked and symbiotic, we will for the sake of our analysis separate out these three concepts and use them to structure our description of how and why the COME ON so effectively supports, and should continue to support, high school mathematics teachers.

Curriculum-centric

The central design component that characterizes COME ON is that it is curriculum-centric.² Its work revolves around a high quality high school mathematics program or

² We are aware that neither those involved in the Interactive Mathematics Program or COME ON consider IMP a “curriculum,” and in fact prefer the word “program” to distinguish IMP
(footnote continued)

curriculum, Interactive Mathematics Program. The COME ON effort is grounded in the IMP instructional materials and philosophy which serve as the measuring stick by which all of the work of the project is assessed, providing it with an uncommon degree of focus and clarity. There is no confusion about identity or guiding principles in this project. The curriculum focuses and guides the work of those who are involved in COME ON, helping in particular to shape the nature of the professional development experiences and interactions designed by the project leaders.

An especially important characteristic of the Interactive Mathematics Program which serves as a kind of lodestone for the COME ON initiative and helps define the underlying ethos of the project is that IMP is problem based and problem-solving based. This is a distinctly different approach to the way mathematics has been taught in the past where the teacher first “teaches” students all they need to know to solve a problem and then presents a problem for them to solve. Typically the message is, just follow the steps the teacher demonstrated. The IMP materials and the COME ON project more broadly take almost an opposite approach. Teachers present a problem, and then ask students how they could solve it. In this way, the problem provides the context for learning and the teacher draws upon the student thinking to facilitate the learning process.

To be clear, the goal of the COME ON project is not to advance the Interactive Mathematics Program per se. The goal is broader—better mathematics learning experiences for all students. However, the project has used a challenging and educative curriculum as a vehicle for demonstrating and illustrating ways in which mathematics can be meaningful for students. The curriculum serves as a common currency for teachers to surface and talk about issues of teaching and learning secondary mathematics. It provides an entry point into the domain of the classroom and a lens through which to reflect upon the practice of teaching, and important ideas about student learning.

From a design perspective what makes COME ON unique is that it instantiates the idea that one can use the dimension of curriculum at the high school level as a focal point for broader learning. In this sense COME ON has designed the curriculum as the leading edge of the change effort.

Professional Learning

COME ON is not just a set of professional development offerings. While it includes a menu of workshops and events, it also offers something even more important to teachers—participation in ongoing learning revolving around but not limited to its high-

from more traditional mathematic curricula. However, for the purposes of our argument we have deliberately used this commonly used term here in this report in order to highlight a key design dimension of the COME ON initiative.

quality curriculum focus. The professional learning that takes place within COME ON exhibits some important features.

First is a focus on teacher content knowledge. Essential to all mathematical learning is rich, substantive content. Teachers themselves need time to deepen their mathematical knowledge and understanding. Too often this type of professional development occurs outside of or unrelated to the classroom experience. The COME ON project however deliberately provides opportunities for teachers to do and learn mathematics within the context of teaching it, through their interaction with the IMP curriculum. In this case, the mathematics surfaces from the problem solving inherent in the lessons, providing the teachers with an experience that both supports their teaching and simultaneously builds their content knowledge.

A second important feature is a focus on the pedagogy of deepening students' conceptual understanding of the mathematics. Implicit to the effective use of IMP is how the teacher values student thinking and questioning, how students work with each other and the teacher to learn, and how the use of rich mathematical problems and careful questioning and facilitating provides the context and impetus for learning that helps students to build their mathematical knowledge and increase their understanding. However, it is not easy for high school teachers to "teach" their students to become active participants in the construction of their own knowledge, or to engineer learning as a collaborative process rather than as a one way flow of knowledge from teacher to student. COME ON therefore deliberately creates learning experiences for teachers aimed at addressing the pedagogical challenges inherent in shifting from traditional methods to practices demanded by a radically different high school mathematics program.

Also underlying professional learning at COME ON is the principle that the individual is the unit of change. The project focuses its work on individual teachers, not the school or the district. This feature acknowledges that, in the culture of high school mathematics, teachers are often given more autonomy than at other grade levels. In addition it also allows the project to avoid some of the challenges of working with school and district sites. But perhaps most importantly, COME ON's focus on the individual as learner and change agent creates repercussive cultural and psychological effects. By respecting and valuing individual teachers and their experiences and knowledge, secondary mathematics teachers' voice and authority are recognized, which in turn lead to increased professional empowerment and learning.

Finally, highly related to the principle of the individual as the unit of change is the principle of "teachers teaching teachers" to which COME ON also adheres, and which helps define the way in which professional learning opportunities are designed within the initiative. COME ON draws upon the expertise of knowledgeable and insightful veteran teachers to plan and facilitate its professional development. The result is a set of courses that draw upon teacher expertise and provide meaningful, useful experiences for

participating teachers. The COME ON facilitators have current classroom experience and speak to their audiences as colleagues. When they as teachers teach other teachers, they achieve almost instant credibility and blur traditionally hierarchical relationships. As a result the climate of the professional learning becomes respectful and collaborative in the same way that an effective IMP classroom seeks to be.

Network

The third key design component of the initiative is that COME ON is organized as a network. COME ON has succeeded largely as a result of its network configuration because it has understood some critical aspects of successful network “growing” which we highlight here.

Through our study of networks over the years we have learned that a strong network consists of three main tiers of participation all of which need on-going attention and sustenance. Such a network includes: a broad-base of participants; a smaller middle tier of participants taking on leadership roles; and a top tier, a small group of experienced, dedicated leaders who guide the network. In a strong network people are invited to participate in multiple ways, and are given opportunities to engage at different levels. In order to maintain viability the network needs to ensure that it is always attracting new members and meeting their needs. Simultaneously those in the middle level require support and meaningful leadership opportunities, while the top level leadership require rejuvenation and support too. Attending to the entry level and the top leadership level is most obvious and straight forward. We have observed that addressing the needs of the critical mid-level leadership is particularly important but often neglected, and not always built into a network implementation design.

Since its inception COME ON has addressed the challenge of developing its network at all of these three levels. By design it is not limited to serving only IMP teachers or those interested in the program. The professional development opportunities are open, accessible and applicable to all high school mathematics teachers in the state of California. Early on the project began to create sessions that focused on important topics for any high school mathematics teacher. Courses such as *Meaningful Algebra*, *Meaning Geometry*, *AP Calculus*, *AP Statistics*, *Designing Group Work* expanded the list of offerings and appealed to many across the state, thereby deliberately creating a broad-base of incoming members into the COME ON network.

Also from the outset the COME ON project deliberately created opportunities to both support existing leadership and simultaneously foster new leadership. The chief strategy for developing the often neglected middle level, as well as the top level of the network, has been what we have already mentioned, a strong emphasis on developing teacher leadership. The cadre of MOST teachers participates in an annual leadership retreat to share practices,

support one another, and learn new information and skills from other mathematics educators. In addition, these teacher-leaders engage in a variety of professional support activities, such as developing new institutes, leading the workshops, conducting action research at their school sites, and addressing local policy issues.

COME ON explicitly strives to create mutually beneficial roles and relationships for teachers at all three levels integral to a successful network. The collegial, collaborative interactions result in a “win-win” situation for all—those leading and facilitating, those becoming interested in greater involvement and testing their leadership potential, and those just beginning to participate in COME ON events. Many MOST teachers told us the level of collaboration and professional support that they have received is simply something that high school mathematics teachers cannot find elsewhere. As one COME ON teacher leader explained, “I love getting to meet with other teachers to renew my spirits and invigorate myself, so I can inspire others!” And a MIST teacher reported, “It's rejuvenating to participate with other teachers in an enthusiastic, learning-oriented setting.”

Key also to the success of the COME ON network is that it strategically resides outside of the K-12 education system, but works within it through its individual teacher members, adhering firmly to the principle that change and improvement must come from within the high school mathematics community. COME ON participants as well as most of the project leaders and facilitators still work in public school settings. The majority, as classroom teachers, brings knowledge and understanding of the realities of teaching high school math back to the project as they plan professional development. The network configuration simultaneously enables COME ON to have influence from the inside by supporting individual teachers by offering them experiences that are valuable and empowering. This outside-inside structure allows COME ON to exist relatively unconstrained by the system.

Finally in the same way that the network exists both inside and outside the system, so does the network balance between serving IMP teachers and serving other high school mathematics teachers across the state. The COME ON network model is dependent on the symbiotic relationship between the IMP community and the broader work that serves all teachers.

We have explained that the network is highly related to IMP—its goals, philosophy and materials—but isn't of IMP. IMP provides the common ground and belief system on which the network is based, but the network itself remains open and inclusive. Such a balance occurs because veteran IMP teachers—those who have taught IMP for several years in their classrooms and who have internalized its philosophy—lead the network. They maintain a fidelity and integrity to the pedagogical approach and to the value of student thinking and conceptual understanding of important mathematical ideas. But one of their roles in the COME ON network is to reach out to other teachers, to design and

facilitate professional development experiences for them, and to incorporate new members into the network. In this way, the network achieves a dynamic equilibrium between, on the one hand, its specific IMP-focus and its steadfastness to the program's fundamental philosophy, and on the other hand, encompassing a statewide open strategy aimed at all high school mathematics teachers.

The Co-Action of the Three Design Components

Each of the particular components we have just described is well-designed, important and integral to the overall structure of COME ON. But it is the mutually supportive interactions among the three that account for the especially strong overall impact of COME ON. The sum is always greater than the parts, but in this case the parts co-act with one another in such a way as to create a program—a curriculum-centric professional learning network—that we believe is effective as well as self-generative, and consequently sustainable.

To further unpack why these three design components are particularly successful in combination with one another we highlight some key aspects of their co-actions.

First and from the broadest perspective, COME ON deliberately attempts to integrate dimensions of change that traditionally are addressed discretely by educational reformers. For example, improvement efforts focused on professional development and learning are linked rarely to curriculum. By the same token innovative curriculum is often developed and promoted in isolation from teachers and teacher learning. And teacher networks, even those organized to foster teacher professionalism, are not necessarily tied specifically to teacher practice. From our experience, we see that many of the failures of innovation and reform are due in part to the isolation of these elements and to the lack of their systematic integration. The COME ON initiative attempts to overcome these issues.

In order for the integration of these traditionally discrete components to be successful, the curriculum on which both the professional learning and the network center cannot be just any curriculum. It must serve as the centrifugal core of the effort. It must be challenging, innovative and educative for both students and teachers, as the IMP is. When the curriculum is of the highest quality, it becomes an ideal focal point as well as binding tissue for a network. As we have noted, IMP serves this function for the COME ON network, providing its teacher members with a mutual set of experiences, a common language and a shared set of values.

Grounding COME ON in the IMP curriculum also anchors both the professional learning and the network directly to classrooms and to questions of teaching practice. Important issues concerning content—pedagogy, student learning and even the nature of the discipline of mathematics—rise up naturally as teachers engage in real lessons in their own

real classrooms. The professional learning and discourse focus on practice, and conversely, practice informs the learning and discourse. As a result the learning becomes important and compelling to teachers. In this sense then one can see that the curriculum serves a larger more important role than it usually plays—as a tool intended to empower teachers and students in mathematical learning, rather than as a mere set of materials to be implemented.

The COME ON network, in which teachers at all levels engage in the kind of learning and discourse generated by focusing on the IMP curriculum, provides the shared cultural norms that link novice and veteran teachers. It is a teacher-led network, in which teachers' voices drive its growth and development. The learning community that builds up around the curriculum continues both to enrich and expand the community, and to draw on that community to build knowledge by involving and educating others. In this way the curriculum-centric professional learning network becomes self-generative and self-sustaining.

The Future of COME ON: Building Statewide Capacity for High School Mathematics Improvement

In our view COME ON represents a powerful and successful model, a new approach to solving an age old problem -- improving high school mathematics education. We have characterized this model as a curriculum-centric professional learning network, where each of the three descriptors captures one of its key design components.

We have reported the COME ON network's accomplishments, as well as the benefits to the teachers who participated. We have shown that COME ON has made a major contribution to enriching the domain of high school mathematics in a way that increases the likelihood of meaningful mathematics instruction and learning for students at the secondary level. And we have proposed that the project has served as a kind of feasibility proof, demonstrating that making progress in this domain is possible.

However we believe there is more to be gained. When we consider the overall design of the initiative—combination of the core design components and how they interact for the betterment of each, as well as for the larger effort, and which we see as responsible for the significant contributions COME ON has produced—we believe that there is great potential for the model to have a significant impact on high school mathematics teaching and culture in the state. The following argument makes the case for extending and expanding the work of COME ON.

Foremost is the fact that the preceding investments in COME ON have paid high dividends. They have helped create an important working asset—namely a still current and fully functioning teacher-led network—which is important in two chief ways.

First, funders as well as those who design mathematics education improvement initiatives both in the state and across the nation can learn from the COME ON network model. It illustrates well the results of the confluence of key expertise developed and key design principles adhered to over the life span of the project. When assembled and working together they create a powerful professional learning context that directly speaks to secondary mathematics teachers. These design features and mechanisms of the COME ON model can be identified, studied and applied more broadly

Second, the COME ON network, with its strong leadership and highly effective design intact, is now at the point where it could become self generating. It stands as a “shovel ready” capacity available to the state of California, one that has been carefully constructed and can now be utilized across the state system. The capacity consists of the COME ON network’s ability to offer professional development, to maintain its own culture of inquiry and learning, to give veteran teachers opportunities to utilize their expertise, to attract teachers who are interested in their own learning and in their own empowerment, and to generate new leadership.

Therefore the current COME ON network serves as a strong foundation for an ongoing network that could serve the whole state. It could make a significant contribution to the strengthening of secondary mathematics teaching in California through the steady support and professionalization of teachers. An ongoing statewide network would, as COME ON has shown, strengthen the professional norms, values, culture and connections throughout the state. It would serve as a vibrant, every growing professional home to its members providing teachers with opportunities to build their knowledge, expertise, and leadership.

In summary then, COME ON has the potential to make still further contributions to the field. It has the potential to provide an educative function by serving as an exemplar of effective design for secondary mathematics education improvement. It also has the potential to serve a capacity-building function by becoming a statewide teacher network focused on the improvement of high school mathematics teaching.