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Providing Open-Access Know How for Directors of Quantitative and Mathematics Support Centers

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Providing Open-Access Know How for Directors of Quantitative and Mathematics Support Centers

Abstract

The purpose of this editorial is to introduce the quantitative literacy community to the newly published *A Handbook for Directors of Quantitative and Mathematics Centers*. QMaSCs (pronounced “Q-masks”) can be broadly defined as centers that have supporting students in quantitative fields of study as part of their mission. Some focus only on calculus or mathematics; others concentrate on numeracy or quantitative literacy, and some do all of that. A QMaSC may be embedded in a mathematics department, or part of a learning commons, or a stand-alone center. There are hundreds of these centers in the U.S. The new handbook, which is the outgrowth of a 2013 NSF-sponsored, national workshop attended by 23 QMaSC directors from all quarters of the U.S., is available open access on the USF Scholar Commons and in hard copy from Amazon.com. This editorial by the handbook’s editors provides background and overview of the 20 detailed chapters on center leadership and management; community interactions; staffing, hiring and training; center assessment; and starting a center; and then a collection of ten case studies from research universities, four-year state colleges, liberal arts colleges, and a community college. The editorial ends by pointing out the need and potential benefits of a professional organization for QMaSC directors.

Keywords

centers, mathematics, quantitative reasoning, support, numeracy, resource

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Cover Page Footnote

Michael Schuckers is currently Director of the Martha E. '62 and Gregg E. Peterson Quantitative Resource Center at St. Lawrence University. He is also Rutherford Professor of Mathematics and a Professor of Statistics there. His research interests are in statistical methods for sports, particularly ice hockey, bioauthentication, and the application of statistical methods generally. He has been at St. Lawrence in Canton, NY since 2002.

Mary B. O'Neill was the director of the Quantitative and Symbolic Reasoning Center at Hamilton College from 1994 to 2013. She expanded those programs and helped to usher in a move to a new and enlarged center. Mary's main interests are quantitative literacy across the curriculum and tutor training. A founding member of the Northeast Consortium for Quantitative Literacy (NECQL), Mary has frequently presented papers and served as a panelist at meetings of NECQL and at Joint Mathematics Meetings. She has been an invited speaker and an external evaluator at several colleges in the Northeast.

Grace Coulombe is the founding director of the Mathematics and Statistics Workshop at Bates College in Lewiston, Maine. She is also a Lecturer in Mathematics teaching calculus, probability, statistics, introduction to abstract math, and several q-courses. Her interests include promoting quantitative reasoning across the curriculum and exploring the mathematical practices of other cultures. She has been at Bates since 2000.

Background

On July 30, 2013, twenty-three directors of centers that support mathematics and numeracy got together in Hartford, CT, to talk about the things that we do. These directors were from various institutions, from large research universities to four-year state universities to liberal arts colleges to community colleges. They came from across the country, from Washington and Tennessee, California and Maine, Michigan and Oklahoma and places in between. With generous funding from the U.S. National Science Foundation (NSF), these center directors gathered in Hartford for a workshop to meet their counterparts from other places, to discuss the work that their centers do and how that work could be improved. The umbrella term that we gave to these centers is Quantitative and Mathematics Support Centers, or QMaSCs (Q-masks).

There are hundreds of QMaSCs in the U.S. They exist in a wide variety of forms. Some focus purely on calculus or mathematics; others concentrate on numeracy or quantitative literacy. Some do all of the above. These centers can be found embedded in mathematics departments or as part of a learning commons or as stand-alone centers. Because of their own institutional history, some are headed by part-time or full-time staff, some are led by a faculty member and some have multiple administrators to handle the significant load. Staffing of QMaSCs can be by professional staff, by graduate students, by undergraduate peers or by a combination of these. Further, the amount of traffic that these centers receive can vary; some have over ten thousand visits in a year. Each center has a unique history of meeting the needs of its own institution. Despite all of these differences, all the QMaSCs have much in common. Among the things we share are the challenges of management; the interactions with others on our campuses; the staffing, hiring and training needs of our employees; and the evaluations of our centers' performance.

Our definition of a QMaSC is intentionally very broad. We consider a QMaSC any center that has as part of its mission supporting students in quantitative areas. Additionally, as we wrote in our proposal to NSF, "The centers are pivotal in keeping students in the Science, Technology, Engineering and Mathematics (STEM) pipeline and in developing a future workforce with the required tools for tackling STEM problems." It is our view that the work of QMaSCs is a critical but often overlooked facet of STEM education.

The impetus for the Hartford workshop came from our own discussions as QMaSC directors at Northeast Consortium for Quantitative Literacy (NECQL) meetings. At NECQL meetings (and in emails and phone calls throughout the year) we found ourselves discussing how we accomplished the work of running a QMaSC. Two of us, Grace and Michael, had founded their centers, which presents a particular challenge. Mary had been the director of her center since

1994. (And yes, referring to the “their” and “her” in the preceding sentences, directors are quite possessive of their centers.) When we met other center directors, we found ourselves engrossed in learning about their centers and the solutions these centers had developed independently. As we conversed about our centers, we lamented the lack of resources available for QMaSC directors, particularly for those starting a center on their campus. Writing-center directors, with whom QMaSC directors are often paired and have much in common, have a long history, and an ecosystem with journals and the International Writing Centers Association. To be frank we were, in part, envious. So we decided to do something.

In 2011, we wrote a proposal to NSF for a workshop. After some discussions with NSF, particularly, some insightful feedback from Ron Buckmire and Lee Zia, we were able to obtain funding for a workshop. That workshop, the one in Hartford, brought together center directors to talk about the things that all QMaSCs have in common. The primary goal for that meeting was to produce a resource for QMaSC directors. To that end, we now are proud to introduce *A Handbook for Directors of Quantitative and Mathematics Support Centers*, which we have edited. This handbook is available online¹ through Scholar Commons at the University of South Florida, and as a bound book through Amazon.com.²

The center directors each brought a draft chapter to Hartford on a specific topic of interest, and they also reviewed and commented on the drafts of others. After this gathering, we returned to our centers and revised our chapters based upon the feedback we received in Hartford.³ In addition to the chapters on specific topics, we added ten Case Studies. These case studies describe specific centers, their missions, and how they meet the needs of their individual institutions. We felt it was important to include case studies in the handbook so readers could see how specific centers simultaneously meet the various challenges of directing a QMaSC.

Contents of the Handbook

In this section, we describe some of the contents of the *QMaSC Handbook* as well as some of the things we have learned about QMaSCs. The handbook has four sections—management, staffing, community, assessment—with chapters about specific aspects of each. There is also a section on starting a new QMaSC and, as mentioned above, a section collecting ten Case Studies.

¹ http://scholarcommons.usf.edu/qmasc_handbook/ .

² <https://www.amazon.com/Handbook-Directors-Quantitative-Mathematics-Support/dp/0977674444>

³ Some of the chapter authors were not able to attend the Hartford workshop.

Whether writing about strategic planning and management, community interactions, addressing diversity, or hiring staff, tutors, and mentors, the authors all have one thing in common—a desire to create an environment that is open, welcoming, helpful, and one which makes collaborative learning possible on all levels. Students who succeed in achieving academic goals, and tutors who learn useful skills in interpersonal relations as well as enhancing their own skills through explaining and working with others, benefit from their experiences in such a setting.

Diversity is a central concern for directors of QMaSCs. Quantitative and mathematics support programs work with students who come from various economic and cultural backgrounds, with diverse academic experiences based on their high school preparation and coursework. Such students are best served by tutors who are equally diverse. As we seek to serve a more diverse group of students, we are aware that math anxiety is a problem that cuts across all these groups. Our chapters on diversity and math anxiety give suggestions about how to help students work on overcoming the stigma of math avoidance.

Our authors repeatedly stress the importance of working with all constituencies of the college/university, including students, faculty, staff, and administrators, at all levels. This involves communicating and coordinating with other support groups on campus, by delivering information about the various programs and support, using all available tools. Such tools may include one-on-one meetings, delivering information electronically, through print, by word of mouth, using current technology and social media, at topical meetings and workshops, and other creative ways that we may not even imagine (just ask the students!).

Our section on hiring and training highlights the necessity of hiring qualified administrative and tutorial staff. Each program has a hiring process that fits its individual needs. It is imperative to look at the college or university's mission statement when establishing goals for a center, then to develop strategies for hiring competent staff and tutors. Once hired, staff and tutors need to know what their responsibilities will be. There should be effective training and follow-up information sessions, as well as an avenue to address challenges and questions about responsibilities.

The director of a QMaSC does not work alone. We learned this fact from the dialogue among participants during the QMaSC workshop at the outset of the project, where initial chapter drafts were shared and commented upon. Members of the group learned that they are not isolated, that there are many ways to do things, and that we all have the interests of our students at heart. Hence, the importance not only of communication at one's own institution, but communication and engagement with directors and groups outside of the sphere of an individual institution.

Assessment is a reality of the current landscape of higher education, and QMaSCs must be aware of how to assess their centers as well as the sorts of assessments that accreditation organizations among others are expecting. There are many forms and foci for assessment from the overall assessment of how a center functions to the evaluation of an individual tutoring session. Understanding these different types of assessment and the audiences both inside and outside of the center for them is important for managing a functional sustainable center. One specific area of assessment is the feedback that directors and other administrators give to QMaSC staff.

Starting a new QMaSC is a challenge that can be daunting. Consequently, we included three chapters about the process of building and growing a new center. One of the important parts of a new center is to define the mission and goals of the center and to have the staff structure in place that is capable of meeting those goals. Essential to that is finding and hiring a center director that fits the institution and fits the center. An additional important aspect of a new center is the center space itself. This includes where the center will be located and how the space will be arranged.

The handbook concludes with ten informative case studies from schools large (Oregon State University and the University of Connecticut) and small (Bates College and Lewis & Clark College) and from research institutions (the University of Washington) to community colleges (Tallahassee Community College). In the case studies, the authors describe how they direct their centers by walking readers through the various aspects of running a center. Readers find out about the challenges of managing budgets at a community college, about using technology to assess tutor performance and about managing a staff in transition.

The Future of QMaSCs

With the publication of the *QMaSC Handbook*, we believe we are providing a resource that will serve the community of QMaSC directors. It has been our great fortune to work with an extraordinary group of center directors-turned-authors from a diverse set of intuitions from around the United States. Generous funding from the NSF made this work possible. We also hope that this publication will spark a conversation about the value of QMaSCs and the important work being done by QMaSC directors.

One of our goals at the onset of this project was to promote the possibility of having a North American professional organization for QMaSC directors. Such societies exist in other places, including the Irish Mathematics Learning Support Network and the Sigma Network for Excellence in Mathematics and Statistics Support based in Wales and England. (Note that we were unaware of these organizations until we were well into the editing of our handbook.) We finished

our discussions in Hartford with this topic, and it is an important one with many benefits. First and foremost, having a professional organization would provide a way for center staff to share best practices for managing and administering. This would improve the work of QMaSCs by having a group dedicated to the professional development of its members. Second, the visibility of the significant work that QMaSCs do could be improved. This visibility is crucial both for centers and for staff. Recognition for centers will help to improve the support for STEM education that centers provide, while recognition for staff and directors will improve their standing within their institutions. Third, a structured professional organization will disseminate information, such as the chapters of our handbook about QMaSCs including examples of best practices and shared processes. This dissemination would be especially beneficial for directors of new centers who would not have to recreate evaluations materials, or mentor application forms, for example. Fourth, having a network of fellow center directors is something that will provide better career support and improved productivity for center staff. We have begun some preliminary discussions in this area but we would welcome insights and thoughts from the readers of *Numeracy*.

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