USING FACULTY LEARNING COMMUNITITIES TO HELP PART-TIME FACULTY IMPROVE DEVELOPMENTAL AND GATEWAY MATH COURSES

by

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Abstract

Community colleges are currently faced with the challenge of improving student success in math courses. While the need for post-secondary education grows, students continue to enter college underprepared. Many students are required to take as many as three semesters of review prior to enrolling in a credit bearing math course. The time involved and frustration with the math itself often results in students' failure to complete their courses of study.

Many colleges meet this challenge by addressing math placement procedures, adding additional support services, and reforming curriculum. When addressing curriculum and instruction, colleges face an additional challenge. Most decisions about changes in curriculum and instruction are made by full-time faculty, yet it is not uncommon for as many as 75% of those courses to be taught by part-time faculty. These faculty need training and support if they are to be successful in implementing new courses or instructional strategies.

The product created for this dissertation is intended to assist institutions as they create appropriate training and support for these faculty. Based on current literature, insights from faculty, and feedback from a pilot Faculty Learning Community (FLC) the author designed a guide to help institutions develop training and support for part-time faculty who have been asked to implement innovative instruction.

The guide includes rationale for the use of FLCs to train and support part-time

faculty and describes the steps necessary to develop and sustain an FLC for the specific context of part-time developmental and general education math faculty who have been asked to implement innovation in their classrooms. The guide is designed to be used as a workbook. In addition to describing the steps needed to create an FLC, it provides a list of specific resources to help with both the process and content of an FLC for part-time developmental math faculty.

Dedication

This dissertation is dedicated to all the community college students who struggle with math and to the faculty who keep trying to find ways to help them succeed.

Acknowledgments

Writing this dissertation has been an adventure and I would like to thank those who have been a part of it. Thanks go out to Kirk Weller for his encouragement, passion for math education and for recommending Victor Piercey to be my chair; to Victor for his undying enthusiasm for improving math education, his wisdom in seeing dissertation work as an evolutionary process, and his insightful contributions and encouragement all along the way; and to Todd Stanislav who brought a fresh perspective and invaluable assistance in enhancing the readability and precision of the work.

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Chapter 1: Introduction

INTRODUCTION

Current projections are that by the year 2020, 65% of all jobs in the U.S. will require some form of postsecondary education. This projection has prompted concern that there will be "an increasing labor shortage caused by the slowing pace of postsecondary attainment and the quickening pace of educational demand" (Carnevale, Smith, & Strohl, 2013, p. 15).

As community colleges face this challenge, preparation in mathematics becomes a major concern. The Carnegie Foundation for the Advancement of Teaching (n.d.) reports that 42% of the total number of students hoping to obtain a post-secondary education are unable to do so because of math requirements. In one study, Achieving the Dream (AtD) followed a cohort of students from 2001 through 2005 and found that only 6% of those students assigned to a developmental math sequence actually completed a college level math course (Virginia's Community Colleges, 2013, slide 3). In addition to the number of students who struggle to fulfill college math requirements, there is growing concern that the math taught in preparation for college level courses and in those courses themselves is not the math needed for success in college or the workplace (Burdman, 2013; Committee on Mathematical Sciences in 2025, 2013; McCormick & Lucas, 2011: & NCEE, 2013).

While this concern is being debated, the McKinsey Global Institute estimates that "U.S. businesses will need an additional 140,000-190,000 employees with 'deep analytical talent' and a high level of quantitative skills by 2018" (Committee on Mathematical Sciences, 2013, p. 120). Whatever the math content, community colleges are facing the challenge of preparing students to develop "cognitive strategies such as analysis, interpretation, precision, accuracy, problem solving, and reasoning...for success both in post-secondary education and the workplace" (McCormick & Lewis, 2011, p. 22).

Recent efforts to address these concerns have focused on better placement, bypassing of developmental placement, curriculum reform, changing math requirements, and addressing soft skills like motivation, persistence, and study skills. Research and implementation of interventions have occurred simultaneously with no clear picture of what are proving to be the most successful strategies.

Throughout this process, few studies have looked at the effect instruction has on student success. Most developmental and general education math courses are taught in the same manner math has previously been taught. If students did not learn the first time using these methods, it is curious that educators would think the same methods are appropriate. Birmingham and Haunty (2013) address this concern saying:

> there is a crying need for improved holistic pedagogy for teaching mathematics along with new approaches to assessment, diagnostics for choosing from the menu of interventions, and comprehensive services. How can colleges give faculty adequate preparation for teaching these [developmental] populations when there is no national consensus about how to carry out mathematics remediation most effectively? (p. 3)

Successful interventions, like contextualization of math content and computer-supplemented instruction, require a change in instructional methodology but do not

address how to bring such interventions to scale. There is little research to indicate how instructors will be motivated and trained to utilize new instructional methods. Most successful interventions have been created by a faculty member or team of faculty members who adopt new methods as part of the creation process but do not have a plan for how to train others to use them.

An additional dimension to the issue of training faculty is the fact that many developmental classes are taught by part-time faculty. According to Elzinga and Haynes (2013, p.77), in 2010 the American Federation of Teachers reported that 70% of community college instructors were part-time faculty. As hiring part-time faculty provides colleges cost savings "related to wages, health care and professional development" (Maisto & Street, 2011, p. 8) it is reasonable to assume that community colleges will continue to rely on their services. Typically, part-time faculty have demanding and diverse schedules with little external incentive to pursue professional development. This creates unique challenges to training faculty for implementation of new instructional methods.

Hepner and Kaufman (2013) surveyed part-time faculty and found that, in general, part-time faculty were disappointed in the lack of professional development beyond basic orientation to the institution. This dissatisfaction "appeared to be related to faculty members' interest in improving their teaching skills" (p. 4). Wood (2015) found that community college faculty are not trained in teaching pedagogy and have little interest in participating in professional development designed to improve these skills. These conflicting reports may indicate that, while part-time faculty perceive the institution as not interested in improving their skills, they themselves may not possess

intrinsic motivation either. Whatever interpretation is made, both studies indicate that community colleges do not tend to provide professional pedagogical development for part-time faculty.

Training and subsequent support of faculty are major issues when attempting to bring innovations to scale. Training designed specifically for the needs of part-time faculty is especially important. If colleges hope to utilize current best practices for instruction in developmental math courses, they need to find effective means to train and support part-time faculty who are requested or required to implement these practices.

PROJECT OBJECTIVES

The intent of this project was to develop a guide for training and support of part-time faculty who are asked to implement innovative instruction in developmental or general education math courses. To develop this guide, insights about training and support were solicited from part-time faculty who have utilized innovative instructional methodologies. In addition, a pilot Faculty Learning Community (FLC) was created, implemented, and analyzed to better understand the dynamics of this form of faculty development. These insights were combined with insights from current literature to create a guide for those who desire to bring successful instructional strategies to scale.

DELIMITATIONS AND DEFINITIONS

Delimitations

- The project was framed in terms of only developmental and gateway math courses.
- The project was designed specifically for part-time math faculty.

Definitions of Terms

- *Developmental level math courses* are those designed to prepare students for college-level math. Although these courses are often required as prerequisites

for general education math courses, students generally do not receive college credit for them.

- *Gateway or general education math courses* vary from institution to institution; these courses fulfill the math requirement for certificates, associate degrees and/or transfer requirements. Typically, general education math courses are College Algebra, Statistics, and some iteration of Math for Liberal Arts Students or Quantitative Reasoning.

- *Part-time faculty* refers to faculty hired as at-will employees. These faculty are typically limited to around 12 credit hours per semester, are not generally involved in committee work or other faculty responsibilities, and receive a lower rate of pay than full-time faculty. The author specifically chose to use this term rather than *adjunct* which has the connotation of being an accessory, aide, or assistant.

- *Soft Skills* are those personal and study skills that support academic skills. They include, but are not limited to, attitudes like persistence, resilience, and confidence, as well as skills like time management, test taking, and communication.

- *Innovative instruction* can be defined many ways. For the purpose of this project, innovative instruction refers to instructional practices that require faculty to substantially change methods of instruction.

CONCLUSION

Following this introduction, the project is presented in four more chapters, followed by a bibliography and appendices. Chapter 2 provides a review of the literature related to the current state of student success in developmental and gateway math courses, the need for innovation in math instruction, issues related to implementing innovative math instruction, and current models for training and supporting part-time faculty. Chapter 3 describes the process and insights used to create the product. These insights consist of findings from a questionnaire given to part-time developmental math faculty, observations from a pilot Faculty Learning Community created for part-time developmental math faculty, and insights from current literature. Chapter 4 presents the training guide that was developed based on the findings described in Chapter 3. Chapter 5

makes suggestions for use of the guide and recommendations for further study. The dissertation concludes with a bibliography and appendices.

Chapter 2: Literature Review

INTRODUCTION

Section One of this literature review lays a foundation for the project by reviewing the current state of student success in developmental and gateway math courses, as well as current initiatives to improve student outcomes. Section Two reviews efforts to implement innovative instruction and complications that arise when attempting to scale this work. Section Three reviews models for providing faculty with professional development when implementing innovative practices and attempting to bring them to scale.

SECTION ONE: CURRENT STATE OF MATH REQUIREMENTS

Math as a Barrier to Student Success and Completion

"I don't think my inability to solve quadratic equations should be a deal-breaker for any further education. I don't think it should have brought me or so many of my classmates to the brink of high-school-dropout status" (Cabral, 2013, para. 21). This statement made by an online journalist as he chronicles his saga to obtain a post-secondary education sums up the dilemma faced by many community college students. Addressing this same concern when speaking to the National Council of Teacher of Mathematics, Uri Triesman referred to developmental math courses as the "burial grounds for the aspirations of students" (Myer, 2013).

A study conducted by the National Center on Education and the Economy (NCEE; 2013) posed two questions: "Is it true that students who do not take Algebra 2 will find themselves unable to succeed at either college or work? What is required to be successful in our nation's colleges and workplaces?" (p. 1). The authors concluded that although "mastery of Algebra 2 is neither an indicator nor a prerequisite for success in college and/or career" (p. 2) it is as indeed a barrier to success in college because at most institutions it is either a requirement for graduation or a prerequisite to a course required for graduation.

In addition, the NCEE report states that passing previous math courses "does not appear to require learning the concepts in any durable way" (p. 2). Although by this point in their education most students have been taught "percent, graphical representations, functions, and expressions and equations...including their application to concrete practical problems" (p. 2) students are not competent in applying these concepts. Because students are not coming into college with these skills, community colleges need to respond to "current employer demands to make sure that they are helping their students develop the kinds of skills that will make their graduates employable" (p. 5). The report also indicates a need to redefine what math courses should be required for a college degree.

Stigler, Givvin, and Thompson (2010) sought to determine what incoming community college students understand about math. As most available data come from placement tests which assess math performance

> not what students understand about fundamental mathematical concepts.... [the authors'] aim was to gather information about the mathematics that underlie the topics they've been taught, including their understanding of the reasons for using

> known procedures. [They] also sought, specifically, evidence that students used reasoning in answering mathematical questions. (p. 6)

The results of the study indicate that students routinely make the same mistakes because they rely on faultily-remembered procedures. Students generally do not apply reasoning skills, although they can when prompted to do so; and "when students are able to provide conceptual explanations, they also produce correct answers" (p. 14).

These results reflect the fact that "U.S. students are taught mathematics as a large number of apparently-unrelated procedures that must be memorized, [so] it is not surprising that they forget most of them by the time they enter the community college" (p. 1) or take a placement test prior to entrance. Stigler, Givvin, and Thompson see this as a major barrier to student success. Because of the way they have been taught, students do not access mathematical reasoning, rather they seek to remember procedures and fail to do so, resulting in developmental placements that may take up to two full years to complete. As Bailey (2009) and others indicate, most students in these lengthy developmental sequences do not complete, dropping out somewhere along the way.

The Carnegie Foundation for the Advancement of Teaching (n.d.) states that "more than 60% of all students entering higher education in the United States are required to complete remedial/developmental courses [and that] a staggering 70% of these students never complete the required mathematics courses, blocking their entry to higher education and a wide array of careers" (para. 1). This means that 42% of the total number of students hoping to obtain a post-secondary education are unable to do so because of math requirements.

Data from Achieving the Dream (AtD) indicate that multiple course sequences prescribed for remediation are a large part of the problem. When AtD tracked a cohort of

97,000 students who had been placed in a three-course sequence, they found that 48% of those assigned to remediation did not enroll, either for the first course or one of the subsequent courses (including the ultimate college-level course). Of those who did enroll, 42% did not complete the course in which they enrolled. This leaves only 10% of the cohort who persisted to complete a college-level course (Jaggars, 2013, p. 5).

Solution: Bypass Developmental Placement

Bailey, Jeong, and Cho (2010) looked at those students who were assigned to developmental courses but chose not to enroll. They found that "about 17% of students referred to math remediation...enrolled directly in a gatekeeper course" (p. 261). Fain (2013) reports that research conducted "by the Community College Research Center at Columbia University's Teachers College found that up to a third of students who place into remediation because of their performance on two popular standardized tests could have passed credit-bearing courses" (para. 14). In a separate study, Scott-Clayton (2102) found that approximately 24% of students who have been placed into remedial math courses could be successful in college-level courses.

Although students who took and completed their assigned developmental courses were more successful in the college-level courses than those who did not, Bailey et al. (2010) report that "about 72% of those who went directly to the college-level course passed that course, while only about 27% of those who complied with their referral completed the college-level course" (p. 261). Although developmental courses prepare students to be more successful in gateway courses, the rate of attrition means that many never get to the point of attempting the gateway course.

Both Calcagno and Long and Martorell and McFarlin (as cited in Rutschow & Schneider, 2011) shed light on this issue by pointing out that, for students who score as

almost ready for college-level courses, developmental coursework has "little or no effect on subsequent academic performance" (p. 16). Boatman and Long (2010) looked at students scoring on the lower end of placement tests and found that "effects of remediation are far more nuanced than previously thought...[and therefore recommend that we] not treat remediation as a singular policy but instead should consider it as an intervention that might vary in its impact according to student needs" (p. 21).

Because we do not gather data from students who fail to enroll in developmental courses, it is difficult to determine how to better address these students' needs. Manski (as cited in Bailey, et al., 2010) speculates that

> initial college attendance can be seen as an experiment in which students gather information about their aptitude and taste for college...learn whether they like college and how much work and effort they will have to exert in order to be successful…[and] their early exit may suggest that they had gathered enough information about the barriers that they faced to decide that the cost would be too high. (pp. 267-268)

However, Triesman (as cited in Myer, 2013) suggests that these students may not have totally given up. They may later return, better equipped to handle the rigors of college. Data collection has not yet become sophisticated enough to determine how many students stop out for a time, later returning to complete a course of study. Triesman cautions against assuming that all students who fail to enroll in, or complete, developmental courses have permanently given up on college.

Solution: Better Placement

In an effort to better place students, Long Beach City College has partnered with the Long Beach Unified School District to use multiple measures and place 49% more students directly in college-level courses (Fain, 2013). South Texas College in McAllen,

Texas partnered with 68 area high schools to create multiple programs and reduced developmental placements by 45% (Fain, 2013). A strategy used in McAllen that is gaining traction elsewhere is dual enrollment or middle college, a strategy that enables community colleges and K-12 partners to collaborate in the effort to ensure that students complete college math requirements (Le, Rogers, & Santos, 2011).

Another strategy gaining popularity is fast track or boot camp programs. These programs are designed to help students review relevant material prior to taking a placement test. Initially, these types of programs were held during the summer to better prepare students for fall enrollment. More recently, colleges are partnering with high schools to offer preparation for placement tests during the school year (Rutschow & Schneider, 2011, p. 29). The intent of such programs is to offer an opportunity to brush up on skills so that students either place into a higher level course or are better equipped and can move through courses more quickly.

Solution: Restructure Courses

An attempt to eliminate the time spent in developmental math courses has resulted in various iterations of mainstreaming students who are not yet college ready.

> Common practices include offering a college-level course with a modified curriculum over a lengthier period of time (usually two semesters) or providing supplemental supports, such as tutoring or additional class periods, for developmental students who are place into a traditional college-level class. Both approaches rely on the assumption that students who have remedial needs are, with extra assistance, capable of mastering college-level work. (Rutschow & Schneider, 2011, pp. 30-31)

Another method for assisting students who are less prepared is referred to as *just-in-time* remediation. This approach is based on "a strong conviction that developmental-level skills and knowledge are best learned when applied to content that is relevant to

students outside their developmental course curriculum" (Rutschow & Schneider, 2011, p. 35). A new model created by City University of New York and implemented at New Community College uses this strategy. They structure the academic calendar with "two 18-week semesters, each divided into a 12-week and a 6-week session, [which] allows for further work in areas where students have not reached a college level of proficiency" (Weinbaum, Rodriguez, & Bauer-Maglin, 2012, p. 3).

Rather than move students directly into college-level courses, another restructuring approach is to compress and/or accelerate developmental courses, reducing the time students use remediating. Bailey, et al. (2010) suggest that

> colleges should combine two or three levels of instruction into one longer, more intensive, accelerated course. At the very least, concerted efforts should be made to encourage students who complete one course in their sequence to go on to the next. This might involve abandoning the semester schedule to prevent gaps between courses, or registering and scheduling students for the next course in a sequence while they are still in the previous course. (p. 268)

Some institutions are experimenting with modularized courses. This approach recognizes that many times students do not need a full curriculum of remediation, but only need to fill in gaps in their knowledge. Therefore, the material is broken into modules and students only take the modules that they need. Formats can vary:

> Some…are instructor-led, [while] others implement a self-paced format, allowing students to complete particular segments of courses at their own pace. In self-paced modularization programs…tutorial software packages... are often used to supplement in-class instruction or as the primary vehicle for teaching students new skills. These packages begin by identifying students' skill deficits and then allow them to work independently on building these skills through increasingly challenging content, built around frequent assessments of students' developing abilities. (Rutschow & Schneider, 2011, p. 29)

The Virginia Community College system has broken its curriculum into nine units

> which can be taken as one-credit classes or Web-based lessons with variable credit hours that allow students to complete more than one unit in a self-paced computer lab and classroom. The number of units that students are required to complete will depend on their placement-test scores and intended program of study. (Gonzalez, 2011)

Solution: Change Math Requirements

Reflecting on the minimal impact these initiatives are making on student success, Burdman (2013) states that the "dismal success rate is causing some in academia to ask whether it's the traditional definition of math readiness – rather than every student who doesn't meet it – that has to go" (p. 4). She sees the current state of math requirements as a conflict between those who contend that in order for students to develop problem solving and critical thinking skills they must master intermediate algebra and those who "predict that, for most students, a second year of algebra will follow Latin into obsolescence as a requirement for all students" (p. 3). Burdman then points to programs based on pathways that are gaining popularity across the country.

In looking at this same issue, The Committee on Mathematical Sciences in 2025 (2013) came to the conclusion that mathematical education should be reframed in terms of the mathematics needed for specific disciplines. Rather than clinging to the notion that college-level math requires an algebra-to-calculus sequence, the committee stated that the "need for a serious reexamination [of college math requirements] is real, driven by changes in how the mathematical sciences are being used" (p. 126).

The National Center on Education and the Economy (NCEE) looked at seven community colleges in seven states, focusing on a diverse selection of the most popular programs taught, to determine if mastery of Algebra 2 is essential for success in college and the workplace. They "did this by analyzing the textbooks and exams and other work

assignments used in these courses. Only one program in one college required entering students to have mastered the content of Algebra II before enrolling in that program" (NCEE, 2013, p. 1). Rather than requiring knowledge of Algebra II, the math required for success in college and the workplace is primarily middle school math, "especially arithmetic, ratio, proportion, expressions and simple equations" and math that is "rarely taught in our elementary or secondary schools, such as schematics, geometric visualization and complex applications of measurement" (p. 2). The authors indicate that, although many degree programs create their own program-specific math courses, students are still required to pass the traditional math sequence in order to graduate. Because placement tests are based on the traditional sequence, student success is often undermined by the need to take a developmental math sequence prior to even enrolling in the math course mandated for graduation.

Burdman (2013) echoes this notion citing data that indicate "only 6% of workers use Algebra 2 and beyond in their careers – and only about 11% may require the high level of critical thinking, problem solving, and math reasoning that is taught in intermediate algebra" (p. 8). Burdman acknowledges that challenging current standards is difficult because the "validity of the standard pathway has been taken for granted" even though "Carnevale...whose research first made the link between two years of algebra and job success, is urging the field not to confuse the correlation with causation, saying the evidence for causation is very weak" (p. 9).

As other math pathways are too new to provide clear data, Burdman is only able to present the debate which boils down to the question of whether Algebra 2 is a valid gatekeeper and summarizes the debate by stating:

> The risky thing for legislators and other people is, if you throw away the math because everybody doesn't use it on the job, what do you have that's going to teach those critical thinking and problem-solving and math reasoning skills? [....] We think math does it. But we're not positive. The (standard algebra-based) math curriculum is the gymnasium we're using to build those muscles. Is there another way to do it? We do know that statistics teaches those skills. What we don't know is the head-to-head comparison. (p. 10)

The Committee on Mathematical Sciences in 2025 (2013) agrees, stating that most colleges "still tend to use calculus as the gateway to higher-level coursework, and that is not appropriate.... the need for a serious reexamination is real, driven by changes in how the mathematical sciences are being used" (p. 126). The authors cite the McKinsey Global Institute's report which "estimated that U.S. businesses will need an additional 140,000-190,000 employees with 'deep analytical talent' and a high level of quantitative skills by 2018" (p. 120). Their answer is not to minimize math preparation or decrease the level or rigor, but to reevaluate the course content in required math courses.

McCormick and Lucas (2011) evaluate the literature and agree that a significant percentage of students are not college-ready in mathematics, nor are they workforce-ready. They find that, while percentages vary between studies, all indicate that "the mathematics readiness problem significantly impacts college success, workforce eligibility, and U.S. competitiveness in the global economy" (p. 20). Their recommendations for post-secondary math education focus on skills as well as content, suggesting a need for a demanding curriculum that "not only emphasizes content knowledge, but also recognizes the importance of developing key cognitive strategies such as analysis, interpretation, precision, accuracy, problem solving, and reasoning [to] prepare students for success both in post-secondary education and the workplace" (p. 22).

Solution: Focus on "Soft Skills"

Fong and Asera cite the National Mathematics Advisory Panel when they state that "many teachers rate working with unmotivated students as the single most challenging aspect of teaching" (2010, p. 1). They also cite Pajares and Schunk in pointing out that "many students have difficulty not because of their inability to do the academic work, but because they do not believe they are capable of performing successfully" (p. 1). Based on these assumptions, Fong and Asera suggest that student support structures designed to increase student motivation will in turn contribute to student success and completion.

Fong and Asera assert that "motivation is derived from four sources of information: mastery experiences, vicarious experiences, verbal (social) persuasion, and physiological and emotional states" (2010, p. 2). Motivational processes are also influenced by the individual's sense of causality as well as the value placed on the activity and the perceived likelihood of a positive outcome. Causality refers to the degree to which the individual believes he or she has control over the outcome. Motivation is also impacted by how important the activity is to the individual. An individual is more likely to be motivated if he or she believes effort will be rewarded with success.

The authors also address the impact social environment can have on motivation. Specifically, stereotype threat and sense of belonging can negatively impact motivation and, therefore, academic success. Fong and Asera cite several studies that indicate that stereotype threat, the fear that one's negative performance will reflect poorly on one's social group, can be mitigated by specific interventions. Likewise, interventions designed to promote a student's sense of belonging can increase student performance (2010, pp. 9-10).

One additional piece of the motivation puzzle is perseverance. “Grit, resilience, and self-discipline all describe the power of perseverance in the face of struggle or setback” (Fong & Asera, 2010, p. 12). Understanding the importance of these factors can move educators from the simple realization that students need these soft skills to a belief that helping students develop these skills ought to be an outcome of education.

Carol Dweck (2008) approaches soft skills from another perspective, that of mindset. She states:

> There is a growing body of evidence that students’ mindsets play a key role in their math...achievement. Students who believed that intelligence or math...ability is simply a fixed trait (a fixed mindset) are at a disadvantage compared to students who believe that their abilities can be developed (a growth mindset). (p. 2)

Dweck’s research has demonstrated that interventions can change student mindset which, in turn, impacts student success. This has been seen to be especially significant for minority groups.

Based on her research and other studies on the subject, Dweck recommends that educators explicitly teach students about “brain plasticity and the new view of talent and giftedness as dynamic attributes that can be developed” (p. 9). In addition to explicit instruction, Dweck recommends that educators support growth mindsets in students by validating struggle, effort, and mistakes as positive means of increasing one’s knowledge or intelligence. Finally, Dweck focuses on styles of affirmation used by educators, pointing to the fact that praising process, hard work, and perseverance encourages a growth mindset while praising ability encourages a fixed mindset.

Original efforts to help educators understand and adopt growth mindset strategies have focused on K-12 education. More recently, efforts have begun to incorporate this

focus in community college settings. Dweck and her associates partnered with 13 institutions in 2014-2015 and 7 more schools in 2015-2016 to study methodologies and impacts of implementing mindset interventions with college students. Their work has been titled the College Transition Collaborative (CTC); its "goal is to promote college persistence and achievement, especially among students from disadvantaged backgrounds, using highly scalable mindset interventions; and to forge collaborative relationships among researchers and higher education leaders" (College Transition Collaborative, n.d., p. 1). Results from these studies have not yet been published.

Yeager and Walton (2011) also address the impact that student mindsets can have on academic achievement. The authors report that "seemingly 'small' social-psychological interventions – typically brief exercises that do not teach academic content but instead target students' thoughts, feelings, and beliefs in and about school – have had striking effects on educational achievement even over months and years" (p. 266). The results are so striking that many see them either as a quick and easy fix or dismiss them as too good to be true.

Yeager and Walton believe that these interventions "hold significant promise for promoting broad and lasting change in education, but they are not silver bullets" (p. 268). Though they are powerful, scaling of these interventions must be studied to determine appropriate contexts and applications. The specific interventions to which they refer focus on changing students' attributions of success and failure, mitigating the power of stereotype threat, and normalizing struggle and failure. For these interventions to be successful, there must be a clear understanding of why the interventions work so that the

actual psychological experience is replicated rather than a process or procedure being reproduced without giving thought to the dynamics that make the intervention effective.

Yeager and Walton are currently collaborating with Carol Dweck as part of the Project for Education Research that Scales (PERTS). PERTS is the research center at Stanford University that is responsible for the College Transition Collaborative. PERTS' purpose is to partner with schools and colleges to improve programs that address student achievement and motivation and find ways to scale these programs to make a broader impact on education (PERTS, 2015). Hopefully these partnerships will provide a better understanding of why interventions work so that they might be applied appropriately in varied settings.

SECTION TWO: INNOVATIVE INSTRUCTION

Instruction in the Math Classroom

While much has been said about placement issues and course content, and some work has been done around students' soft skills, only a few studies look at the impact of classroom instruction on student success at the developmental and general education levels. There is some research on pedagogy in higher level math courses at the post-secondary level but most of the current research has focused on K-12 math instruction.

Stigler, Givven and Thompson (2010) report that while community college faculty generally have more advanced knowledge of math than do K-12 faculty, they tend to use the same teaching methods that are used in K-12 math courses. These methods "focus almost entirely on practicing routine procedures with virtually no emphasis on understanding of core mathematics concepts that might help students forge connections among the numerous mathematical procedures that make up the mathematics curriculum in the U.S." (p. 2). The authors contend that "substantive improvements in mathematics

learning will not occur unless we can succeed in transforming the way mathematics is taught" (p. 3).

Birmingham and Haunty (2013) state that "there is a crying need for improved holistic pedagogy for teaching mathematics along with new approaches to assessment, diagnostics for choosing from the menu of interventions, and comprehensive services." (p. 3). The Committee on Mathematical Sciences in 2025 (2013) states that the "need to create a truly compelling menu of creatively taught lower-division courses in mathematical sciences tailored to the needs of twenty-first century students is pressing and partnerships with mathematics-intensive disciplines in designing such courses are eminently worth pursuing" (p. 123). The committee indicates that improved instruction in these courses would include "active learning techniques...making courses more relevant for students' fields of specialization, and creating...high expectations among students" (p. 123).

Cox (2015) conducted a study designed to "open up the 'black box' of developmental math teaching at the community college level" (p. 264). Cox observed instruction and classroom interaction, interviewed instructors, and examined curricular artifacts to analyze pre-algebra instruction in six sections at two institutions. Her results indicate that

> differences in pedagogical goals (and related notions of mathematical proficiency) were integrally linked to differences in the *what* and *how* of assessing student learning, and that contrasting approaches to assessment maintain critical implications for accounting for failure inside developmental classrooms. (p. 264)

More specifically, Cox found that the four sections observed at College A focused on memorization of rules and practicing procedures with classroom time spent

predominantly on lecture and problem practice. When accounting for lack of student success these instructors attributed student failure to lack of practice and inability to memorize rules and procedures. In contrast, in the two sections observed at College X instructors "guided students through a series of steps that wove procedural skills with conceptual understanding and adaptive reasoning" (p. 274). These instructors assessed student competency based on students' abilities to explain the process by which a problem might be solved.

Acknowledging the limitations to her methodology, Cox compared the two approaches by using course pass rates. Both institutions used college-wide common, standardized final exams. The percentage of students who passed the course at College A varied per section and ranged from 50% to 70%. In contrast, pass rates at College X ranged from 76% for one section to 90% for the second section.

In conclusion, Cox states that "efforts to improve developmental math outcomes across community colleges require intensive focus on what actually happens inside classrooms" and that "without sustained attention to the dynamics among instructor, students, and math content inside developmental math classrooms, 'remedial' pedagogy and disappointing learning outcomes will most likely prevail" (p. 283).

After reviewing a scan of 60 institutions conducted by the Community College Research Center (CCRC), Bickerstaff and Monroe-Ellis (2012) came to the conclusion that, while faculty and administrators were sincerely making efforts to improve student success, most "were aware that their approaches were yielding negligible outcomes" (p. 1). In looking at reasons for lack of student success in spite of what seem to be promising innovations, Bickerstaff and Monroe-Ellis indicate that one aspect is lack of attention to

instructional methods. For example, while compressed courses may allow students to cover material more quickly, "if course content and pedagogy remain the same and are not relevant to students' academic and professional goals, students may continue to disengage" (p. 2).

Likewise, computer modules allow students to be self-paced "but they often rely on a skill-and-drill approach, which may do little to address student motivation, engagement, and conceptual understanding" (p. 2). Weller, Trouba, and Wood (2015) compared knowledge retention of students who utilized computer modules to students in traditional sections or sections that utilized online homework. Results indicate that, while computer modules were effective for reviewing familiar content, students who used computer modules had difficulty when new concepts were introduced. Instructors interviewed found that students were more successful with new content when they were provided more than computerized modules (p. 22).

Bickerstaff and Monroe-Ellis (2012) note

> pedagogical improvement is often de-emphasized in developmental education reform.... Most faculty enter community colleges as disciplinary rather than pedagogical experts; few have had experience examining and refining their classroom practice. Research suggests that innovations that explicitly try to change pedagogy are the rarest and most challenging to implement. This is in part the result of traditions of faculty autonomy, increased reliance on adjuncts, heavy workloads, and weak instructional leadership. (pp. 2-3)

Challenges to Improving Instruction

Yoshinobu and Jones (2012) contrast traditional math instruction with inquiry-based learning explaining that traditional instruction is teacher-centered and driven by a need to cover all of the material deemed necessary. The authors indicate that this approach typically results in students 1) developing self-defeating attitudes about learning

math, 2) adopting the habit of replicating the instructor's procedure rather than seeking to understand the math, and 3) giving up on math and not choosing STEM majors.

The danger of students adopting the notion that math is simply a series of procedures to be memorized and performed was the focus of a case study by Schoenfeld (1988), who found that although a course is taught well and students perform well on standardized tests, students do not necessarily grasp important concepts and connections. In fact, traditional instruction can do more harm than good.

In his study of a tenth grade geometry class, Schoenfeld found that textbooks and tests often direct instruction. In this class, as in most, the textbook and the instructor presented processes for solving problems and students mimicked these processes with a goal of doing well on standardized tests. The end result was that, although the students did well on the test, they

> gained at best a fragmented sense of the subject matter and understood few if any of the connections that tie together the procedures that they had studied. More importantly, the students developed perspectives regarding the nature of mathematics that were not only inaccurate, but were likely to impede their acquisition and use of other mathematical knowledge. (Shoenfeld, 1988, p. 145)

In contrast to this traditional approach, Yoshinobu and Jones (2012) suggest inquiry-based learning (IBL) in which the instructor guides students through an interactive process in which students engage with the material, present their ideas, and construct their understanding based on the discussion. This methodology involves "spending extended time on key concepts, and thus, coverage… will look different… as some topics are shifted into the background for reduced emphasis" (p. 309). This extended time allows for greater depth of understanding. The less critical material is either eliminated or covered in other ways.

However, while it provides opportunity for greater understanding, the extended time spent on some topics raises what the authors call the coverage issue. Faculty "at all levels have some external and internal pressures to 'get through' all the required material" (p. 303). In order to cover all of the material, the course must proceed quickly. This pace lends itself to the more traditional lecture style of instruction.

Studies that demonstrate the effectiveness of the IBL approach focus on applications to high school courses as well as higher level college courses, like Intro to Proofs, Number Theory, and Differential Equations; courses that are designed for math majors. These studies "suggest that IBL courses… enable students to develop greater strategic competence and a more productive disposition without much, if any, sacrifice in their procedural fluency" (p. 313). Yoshinobu and Jones contend that IBL methods can be adapted to any level course. It can take many forms but "has as a basic feature the focus on student thinking, sense-making, and student-driven development of key mathematics" (p. 309).

While the coverage issue is problematic, Yoshinobu and Jones contend that the traditional model of instruction is not effective for many students, "pushing away students who are capable of succeeding" (p. 314). They therefore suggest "extensive use of inquiry-based learning to develop students' mathematical abilities, with additional content developed through occasional, well-timed presentations and other out-of-class assignments" (p. 314).

Bickerstaff and Monroe-Ellis (2012), suggest that the issue of improving math instruction in the community college can, in part, be addressed by consciously focusing on the process of implementing innovation. This process begins with using data, as well

as student and faculty perspectives, to diagnose the challenges faced by students. Once challenges have been clearly identified they must be prioritized, again utilizing the input of all stakeholders. After selecting an appropriate intervention to address the identified challenge(s), those implementing it

> must adapt it to meet the needs of [their] students, the organizational culture, and college policies.... At the classroom level the continuous refinement process invites experimentation and innovation as instructors try new classroom approaches and document and share their results. (p. 3)

As an example of this process, Bickerstaff and Monroe-Ellis describe innovation implemented at Pellissippi Community College (PCC), where a team of stakeholders determined the top priority to be "improving students' conceptual understanding of math content" (p. 3). The team at PCC first reviewed the literature, and determined the best approach to take; the "faculty designed an approach that combines collaborative learning with individual computerized modular practice" (p. 3). After an initial pilot run of three different programs, the faculty chose what they determined to be most effective and launched a fully scaled program. To support this innovation the college continues to require professional development specific to the issues faced by faculty in implementing the new approach.

While the success of PCC is compelling, the authors indicate that many different approaches to a problem "can be effective if they are deliberately aligned and refined to meet the needs of the students within a particular context" (p. 4). This process of adopting and adapting innovation is challenging and "inevitably leads to potentially difficult conversations about teaching, learning, and expectations of students and

faculty.... [Yet] can create a positive professional culture in which stakeholders see the fruits of their efforts to improve student learning and achievement" (p. 4).

Working with the Scaling Innovations Team, Bickerstaff (2014) looked more closely at the impact faculty have on implementation of innovation in developmental education. After stating that "some of the most promising developmental education innovations require that instructors significantly change their classroom practice," (p. 1) the author describes three perspectives faculty may have toward innovations that require them to change their instructional approach. The three categories describe orientations that can be fluid and context-dependent. They are defined as: ready to act, ambivalent, and reluctant to change. Those faculty who are "ready to act" may fall into this category because the required changes align with their teaching philosophy and/or if they are willing to change but are in need of support whether or not they share the same philosophy. Those who are ambivalent may be so either because they have other priorities, require more evidence of effectiveness, or question their own ability to change. Those who are reluctant to change may be satisfied with the status quo, require further demonstration of effectiveness, or are not comfortable with the approach being taken.

Bickerstaff confirms the legitimacy of some faculty hesitations and presents strategies to address their concerns. These strategies fall into two basic categories: strategies designed to address concerns about the reform itself and strategies designed to allay faculty fears of competency with a new methodology. Often faculty need to be convinced that the reform will indeed improve student success. They also need assurance that they will receive the support necessary to change instructional methods and a safe environment in which to take the risks required when trying something new.

Fong and Visher (2013) describe the process used by Broward College in Florida and Tarrant County College in Texas when implementing accelerated math courses. Broward designed and implemented Math Redesign, a compressed program that enabled students to complete two courses in one semester. The Math Redesign program utilized group problem solving in class, with computer-aided instruction for homework. Tarrant County developed and implemented ModMath, a model that breaks the developmental math sequence into modules and delivers instruction utilizing a computer program, allowing individuals to proceed at their own pace. This strategy enables students to complete as many as three courses in one semester.

When bringing these innovations to scale, "Broward and Tarrant County used a model of faculty ownership combined with supportive leaders and data analysis to ensure adequate resources and facilitate communication and engagement" (p. 50). Neither college moved immediately to full scale implementation, choosing rather to implement change slowly. Pointing to the issue of faculty buy-in, the authors cite an associate dean who said:

> We still have faculty who like to do their own thing in a certain way, and would be unhappy teaching a class like this, and it's not worth it to rock the boat that much and make them that unhappy. (p. 50)

One of the program coordinators "emphasized the importance of faculty preferences and did not want faculty to be directed to teach a certain way at this point. She said that she would advise other colleges to 'start small and see what you need, see who will help you get it done.'" (p 50).

Both colleges involved in the study also expressed their desire to have adequate evidence of effectiveness before fully scaling their programs and both chose a "faculty-

driven reform bolstered by engaged leadership and a culture of continuous improvement.... [This] grassroots, bottom-up approach to scaling... has flexibility to adapt as the institution's needs or circumstances shift" (p. 50). The emphasis on faculty engagement and support contributes to sustainability.

In a report written for the Institute for Higher Education Policy, Cullinane and Leegwater (2009) describe the Model Replications Institutions project. The MRI, an initiative supported by the National Science Foundation, identified "work of Minority Serving Institutions in STEM education" that is worthy of replication. The report describes the work of nine institutions, three Historically Black Colleges and Universities, three Hispanic Serving Institutions, and three Tribal Colleges and Universities. It focuses on seven areas that the American Institutes for Research have determined to be "critical infrastructure components ... that appear to improve student achievement in the STEM disciplines" (p. 4).

In discussing requirements for replication the authors accentuate the need for "faculty and administrative buy-in" (p. 20). In addition to this buy-in, Cullinane and Leegwater indicate that when developing a project, institutions need to explore the "whats" and "whys" of evaluation and discuss how to use evaluation results for decision making to support sustaining or institutionalizing the project. Institutions need to incorporate comprehensive formative and summative evaluation in the project, and use collected data to identify ways to improve the evaluation and the evaluation process (p. 21).

In order to impact instruction, Bryk, Gomez, and Grunow (2010) contend that there is a need for a new model of research and development, one that blends traditional

research with the applied problem solving conducted by practitioners. The questions driving this improvement are: “First, what problem(s) are we trying to solve? Second, whose expertise is needed to solve these problems? And third, what are the social arrangements that will enable this work?” (p. 4).

While listing the problems we are trying to solve may seem obvious, the authors contend that “in the last decades our...responses to them have been confused.... [and] the natural result is a cacophony of questions and innovations that fail to accumulate into real progress on core concerns” (p. 4). If numerous innovations to address a multitude of identified problems have not resulted in significant forward progress, it appears there is a need to address the connectedness of these problems in order to bring solutions to scale.

With this diversity of problems also comes diversity in who assumes responsibility for solutions. “While innovations abound in education, [the authors] argue that the field suffers from a lack of purposeful collective action. Instead, actors work with different theories of the same problem, activities are soiled, and local solutions remain local” (p. 5).

Bryk et al. describe a structure the Carnegie Foundation calls a networked improvement community (NIC). The NIC is designed to clarify, coordinate and implement sustainable strategies to address complex educational problems. It draws on the expertise of varied contributors and provides a structure to ensure that effective improvements are portable, true to significant design elements, and able to adapt to varied contexts: “In an arena such as education, where market mechanisms are weak and where hierarchical command and control is not possible, networks provide a plausible

alternative for productively organizing the diverse expertise needed to solve complex educational problems" (p. 6).

Dolle, Gomez, Russell, and Bryk (2013) also describe NICs, explaining they are a Carnegie's Pathways initiative intended to integrate the work of researchers and program designers with innovative implementation of teaching professionals to more rapidly impact classroom instruction. Carnegie's Pathways initiative is an effort to create three distinct math pathways, each focusing on math content most appropriate to mathematical needs of specific programs of study. In addition to the traditional progression from Algebra to Calculus that is appropriate for science, technology, engineering, and mathematics (STEM) degree programs, Carnegie has developed developmental math pathways designed to prepare students for statistics or quantitative reasoning courses. These pathways provide math courses that are more appropriate for non-STEM majors.

As these courses are developed, the NIC is able to combine insights of faculty with the analysis of researchers, apply the outcome and report back results which are then factored into the researchers' analysis. This cyclical process allows research to affect immediate outcomes and achieve the overall objective of student success: "The most important feature of a NIC is a common problem or challenge around which the work of the network is organized" (p. 3). The network is structured around a hub that coordinates the activity. While Carnegie began serving in this capacity, the "long-term goal is for hub responsibilities to progressively transition from Carnegie to a leadership body within the Pathways network" (p. 4). The next layer in the network is the general membership, made up of teams from participating colleges. At the time of their report, this network consisted of 26 community colleges and 4 universities spread over 8 states. In addition, the network

includes specialty consulting groups with expertise in pedagogical issues, and contracted groups that focus on technological aspects of the project.

The network is focused around four elements. A "*rapid analytics infrastructure* is a core capacity of the hub that helps collect, manage, analyze, and share data across the network" (p. 4). This ready access to data allows for formative assessment of instruction and provides resources to draw conclusions from comparisons between individual instructors, students, and contexts. The second element, *common tools and routines*, protects the integrity of the program, keeps the focus and parameters clear, and allows for meaningful comparisons and collaboration. Another key element to the network is what Carnegie has termed *innovation conduits*. These strategies ensure that innovation is channeled effectively by creating a system through which "promising ideas inside or outside of the network are identified, tested, refined, and scaled" (p. 6). Finally, "NICs require a *culture that embraces a collaborative science of improvement"* (p. 6).

In contrast to the highly structured systematic approach taken by the Carnegie Foundation, Ewell (2002) collected lessons learned from "a diverse array of change initiatives directed toward improving undergraduate teaching and learning" (p. 1). Ewell points out that change initiatives generally begin as alternative or pilot programs. These initiatives differ from current practice and are generally funded by sources other than the institution's operating budget. These factors contribute to the difficulty of eventually bringing such programs to scale. In addition, most institutions of higher education do not have a sense of urgency for improvement, but rather look elsewhere for answers to current concerns.

Responding to this, Ewell suggests that true reform will require systemic change in addition to clear evidence that alternative approaches are both effective and portable. He summarizes work done by the Pew Foundation that examined both internal and external forces that can impact this change. In looking at internal initiatives, Ewell indicates that new initiatives face a twofold challenge; in addition to proving that they are more efficient and achieve better results, they must "operate in the face of substantial organizational and resource incentives that continue to reward the current way of doing things" (p. 10). In light of this, the author indicates that "successful change initiatives in higher education settings must rely on persuasion, diffusion, and voluntary adoption far more than on top-down implementation" (p. 11).

In a summary of lessons learned, Ewell identifies three key elements for successful change. The first of these is collaboration that is clearly structured, meets mutual expectations, and results in substantive products. These products must yield tangible benefits to the individual as well as the group. Second, it is key to have clear communication among those involved and provide credible data both internally and externally. Ewell found that though some successful initiatives were proposed by those at the top of the organizational chart, development and implementation was best achieved by employing those most involved with the work. When encountering issues, those involved with the work were able to address problems and modify plans. Finally, for the new to replace the old, these initiatives required proof of product, trust, and refinement.

Pratt (2005) presents "an in-depth examination of the intentions and beliefs that give direction and justification to what teachers do and how they think about their teaching" (p. xiii). His work reveals another factor to consider when looking at

instruction in the math classroom. Based on a study of 253 teachers of adults in 5 countries Pratt distills distinctions in perspective to "five qualitatively different perspectives on teaching" (p. xiii) which he summarizes as:

1. Transmission – Effective Delivery of Content
2. Apprenticeship – Modeling Ways of Being
3. Developmental – Cultivating Ways of Thinking
4. Nurturing – Facilitation Self-efficacy
5. Social Reform – Seeking a Better Society (p. xiii)

Pratt analyzes these perspectives by comparing actions, intent, and beliefs. In this analysis, Pratt indicates that these perspectives are not a matter of choice or something that can be developed, any more than personalities or world views are a matter of choice or can be developed. As these perspectives impact instructional intent and style, such analysis is beneficial when looking at the challenges faced when implementing innovative instruction.

Quint, Jaggars, Byndoloss, and Magzinnik (2013) provide an analysis of the efforts of 15 institutions that scaled up promising developmental education initiatives. The study was conducted by the MDRC in collaboration with the Community College Research Center. It was called the Developmental Education Initiative (DEI) and addressed the following three questions:

1. To what extent did the colleges scale up their chosen developmental education reforms to serve more students?
2. What factors affected the colleges' ability to expand their programs and practices?
3. To what extent were the colleges' strategies associated with improvements in student outcomes? (p. ES-2).

While the study found that "the majority of strategies fell far short...reaching less than half of the students to whom they were targeted" (p. ES-4) it did provide insight into what is needed when scaling up initiatives. The initial assumption that a key barrier to scaling initiatives was related to funding proved to be naive as "it became apparent that a variety of other barriers stood in the way of scaling" (p. ES-2). The three major challenges identified were:

1. clearly defining the parameters of "scaling up,"
2. determining what efforts are worth scaling up, and
3. dealing with the significant increase in enrollment that occurred at the time the project (p. ES-3).

Key findings of the report pointed to the need for necessary resources, including "adequate staff, space, and, for many interventions, technology; strong and positive communication...with the vocal support of the president proving especially critical; [and] professional development for staff members and staff involvement in planning and oversight" (ES-4).

Of the 46 strategies studied, three involved "implementing new approaches to make instruction more relevant and engaging" (ES-4). These approaches required participation of all faculty teaching the course. "This is a particularly efficient mode of scale-up because all necessary faculty resources are already in place and because all students who need developmental classes must follow the prescribed approach" (p. ES-5). In contrast to this, 'limited scale-up sometimes reflected colleges' competing priorities and values" (p. ES-5) including a desire to provide options for students, "a

perceived need to scale *back* when strategies appeared to be ineffective, and a desire to evaluate the strategies' apparent effectiveness before moving forward" (p. ES-5).

In addressing the third question regarding the impact of these strategies on improved student outcomes, the authors indicate that "the methods used in this study can show that the DEI was *associated* with the outcomes that were observed but not that the DEI *caused* these outcomes" (p. ES-6). In comparing outcomes for participating students with those who did not participate only 39% of the strategies demonstrated statistical significance. "About a third of the strategies were associated with positive gains for the students, and a handful were associated with negative outcomes" (p. ES-6). "In general strategies that reached more than 50% of the students whom they aimed to serve were more likely to be associated with positive outcomes than strategies that reached smaller numbers of students" (p. ES-7). The authors noted that this correlation might be attributed to the fact "that colleges that were effective in engaging students in their focal strategies were also likely to be effective more generally" (p. ES-7).

In conclusion, the authors state:

> At the outset of the DEI, little was known about what is required for scaling up initiatives in community colleges. This study suggests that additional resources may be necessary but are not sufficient. Also critical are communication, engagement, and a commitment to uniform practice throughout a department or institution. Time is also critical, not just for putting new interventions in place but also for securing the buy-in and support needed for smooth implementation. Yet another lesson concerns the importance of having expectations that are well specified and shared by all parties. Finally, the experiences of the DEI colleges serve as reminders that scale-up is just one of many objectives that community colleges strive to meet, that the complexities of students' lives can interfere with scale-up efforts, and that both high ambitions and realistic expectations for expanding promising initiatives are in order. (p. ES-8)

Rattan, Good, and Dweck (2102) approach the impact of instruction from a different perspective. The authors describe four studies designed to determine if "an entity (versus incremental) perspective leads those in a teaching role to spontaneously focus more on comforting students for low ability following failure and on using practices that could lock students into long-term low achievement" (p. 731). The authors explore what pedagogical practices, based on entity versus incremental perspectives, communicate to students, hypothesizing that instructors with an entity perspective will communicate less confidence in their students.

The studies confirmed the authors' hypotheses; "holding an entity theory led people to comfort students for their presumed low ability in the subject and to engage in pedagogical practices that could reduce engagement with the subject, as compared with participants who held a more incremental theory" (p. 735). In addition, these instructors "were not only more likely to diagnose low ability and comfort students based on just one low initial performance, but they also directly reported that they did not expect as much future improvement for their students" (p. 736). The authors believe that their findings "suggest a critical point of intervention with instructors" (p. 736).

Models for Professional Development

Daly (2011) contends that the increased pressures and complexity of higher education require more effective faculty development offerings. Many current offerings do not address the necessary issues of teaching and learning, are not designed to meet clear objectives, and are often "shaped more by the priorities of administrators rather than by needs of faculty members" and are therefore not valued nor well attended by faculty (p. 4).

In a mixed methods study exploring the correlation between part-time faculty job satisfaction and opportunities for professional development, Hepner and Kaufman (2013) found a need for professional development that extends beyond basic orientation to the college. In reviewing the literature the authors found that full-time faculty members are generally offered twice as many opportunities for professional development and that often part-time faculty are not given the training and support necessary to do their jobs.

The actual findings of the study did not indicate any correlation between job satisfaction and professional development offerings. The authors conclude that adjunct faculty are motivated to teach and "do what they feel needs to be done to be effective in their roles" (p. 8). However, the authors also reference data and anecdotal comments that indicate the part-time faculty in the study would have appreciated meaningful professional development and would feel more supported and connected to the institution if such training was provided.

Rather than focusing on how to motivate current faculty to participate in professional development, Wood (2015) recommends hiring individuals who have a commitment to student learning and who are motivated to engage in lifelong learning themselves. This can be systematized by using keywords when scanning resumes, providing interview questions designed to draw out examples of learning and personal beliefs about professional development, and training those who hire part-time faculty to look for these qualities as well.

Webster-Wright (2009) contrasts professional development (PD) with professional learning (PL) and suggests the importance of reframing our professional development practices. She states that although "no one can make another person learn,

professionals can be supported to continue to learn in their own authentic way while taking into account the expectations of their working contexts" (p. 727). While PD can be used for many different purposes, the focus of PL is authentic learning that leads teachers to "develop 'new understandings' about their own practice" (p. 728).

Although she acknowledges that PD has become more flexible and learner-centered, utilizing active learning techniques, Webster-Wright characterizes PD as being training which assumes that learning can be packaged and delivered through some form a of a program. Whether it is a workshop, seminar, webinar, or retreat, the focus of PD is on delivering content, and delivering that content through some type of event.

In contrast, Webster-Wright characterizes PL as a process that occurs over time, requires engaged learners, is contextualized in the work environment, and generally includes a social component. Webster-Wright does not see PD and PL as a dichotomy. She suggests reframing PD in terms of PL, hoping the change in conceptualization will result in a change in training practices.

As an alternative to traditional faculty development Daly (2011) cites research that supports the value of faculty learning communities (FLCs). FLCs are structured around the needs of faculty and therefore focus on relevant issues, encouraging faculty to take new concepts gained from readings and discussion and immediately apply them to their classrooms. The encouragement and feedback from the FLC provide a safe atmosphere in which faculty can take the risks inherent in trying something new. Faculty report that new "teaching practices [are] paying off in terms of improvements in students' critical thinking skills, ability to think holistically, and capacity to synthesize and integrate information and ideas, among other learning outcomes" (pp. 4-5).

Daly's study encompassed 51 faculty members at 7 different institutions who each participated in a yearlong faculty learning community. At the end of the year, 40 of the 51 participants consented to be interviewed. These interviews revealed that "faculty learning and development occurred through individual and social processes that enhanced these faculty members' motivation and desire to improve teaching and learning" (p. 6).

The structure of the FLC was flexible, allowing for autonomy. Participants indicated that at first this was challenging but "it compelled them to take ownership of their own learning process" (p. 9). This ownership allowed faculty to determine their own goals which enhanced motivation and value of the experience. It also countered the "view on some campuses that faculty development programs were mechanisms to correct deficient performance" (p. 9).

In addition to increasing motivation, the FLC experience affirmed faculty as they realized they had something to offer their colleagues. Other faculty admitted that they were unfamiliar with concepts like student engagement or that they lacked the knowledge needed to promote student-faculty interactions and collaborative learning in the classroom. They indicated that the FLC provided a safe, confidential venue in which to admit their limitations and acknowledge that they had more to learn about becoming effective teachers (p. 10). In addition to equipping faculty for the challenge of implementing innovation, Daly concludes that "this study demonstrated how topic-based communities can promote specific types of pedagogical change" (p. 12).

Bickerstaff, Edgecombe, and the Scaling Innovations Team (2012) address the challenges posed by "institutional norms and structures...conceptions of academic freedom," and time constraints, indicating that "well-crafted faculty engagement

activities can encourage experimentation and generate improvements in teaching and learning" (p. 1). Based on field work with their Scaling Innovation partner institutions, the authors present a framework for professional development opportunities that can effectively support faculty in implementing new pedagogical practices. This framework contains three elements:

1. the purpose or learning objective,
2. the activities used to reach that objective; and
3. the venue or forum for learning.

The authors conclude that faculty development opportunities developed within this framework help develop "a shift toward a culture where pedagogy is not invisible, where experimentation is expected and embraced, and where continuous improvement subject to rigorous assessment is normative" (p. 4). When used as a part of new program implementation, this framework can also promote "a sense of ownership among faculty and contribute to the sustainability of the innovation" (p. 4).

Bickerstaff, Lontz, Cormier, and Xu (2014) developed a course built on discovery learning titled *Concepts of Numbers for Arithmetic and Prealgebra* at Montgomery County Community College (MCCC). In the fall of 2008 the course was piloted with one section. By 2011 all traditional basic math sections had been replaced with this new course. The scaling of the course "was examined as part of *Scaling Innovation,* an implementation and research project that investigated how instructional reforms in developmental education are initiated, adapted, and scaled" (p.7).

Using a quasi-experimental design, the study looks at student demographic and success data as well as faculty perceptions about the reform and direct observation of both classroom and professional development activities. Results indicate that faculty's

main concern in teaching the course was lack of confidence when using a discovery learning approach. To address this issue, in the spring of 2012, the faculty development team "launched CON-NECT (Concepts of Numbers – Networking Educators' Collaborative Thoughts) to create more intensive and ongoing support for faculty" (p.10).

The study reports two significant findings. First, it was important for faculty to have "visible examples of discovery learning... 'Seeing' the curriculum in action appears to be essential for faculty to adopt a new teaching style" (p. 12). Second, it was important for faculty to have a safe environment in which they could reflect on their own pedagogy as well as give and receive feedback. The time and space for reflection and feedback proved to be very productive; the results were used to revise the textbook. In this case, professional development was also contextualized, as all instructors were teaching the same course, and structured, as the process was guided by the faculty development team. "In these ways CON-NECT provides a model that could be adapted to support faculty to change or refine their teaching in both reform and nonreform contexts" (p. 13).

Cox (2003) also notes the importance of "providing safe, supportive communities in which faculty can investigate and take risks in implementing new approaches to teaching and by increasing the collaboration and coherence of learning across disciplines" (p. 162). Based on 25 years of work at Miami University, Cox describes the connection between the scholarship of teaching and learning (SoTL) and Faculty Learning Communities (FLCs), "how and why this connection works, its products, individual developmental stages of its participants, and evidence of its success" (p. 161). Cox reports that the FLC program at Miami University has resulted in "more active, learner centered, multidisciplinary approaches to teaching" (p. 162).

In categorizing FLCs at Miami University, Cox distinguishes between cohort-based and topic-based FLCs. Cohort based FLCs draw from specific groups. At Miami University the four types of cohorts have been: faculty in years 2 through 5, faculty termed mid-career and senior, department chairs, and graduate assistants. Each cohort determines its own area of interest for their particular FLC. In contrast, topic based FLCs gather around a shared concern or issue and the group focuses on addressing that concern or issue.

To participate, faculty must apply and are selected based on "commitment to quality teaching, level of interest in the program, need, openness to new ideas, potential for engagement in and contributions to the community, and plans for use of the FLC year" (p. 164). Weston and McAlpine (2001) describe three phases of individual faculty development in the Scholarship of Teaching and Learning (SoTL):

Phase One:	Come to an understanding of one's own teaching style and student learning.
Phase Two:	Discuss these issues with other faculty.
Phase Three:	Move toward broader issues of the SoTL (p. 167-168).

Cox sees the value of an FLC in helping faculty move through these phases. As part of an FLC, faculty may start in what Weston and McAlpine refer to as Phase Two, discussing teaching and learning with other faculty. This interaction leads to the personal reflection of Phase One. As Cox states, "whether they have moved through phase 1 or not, faculty often join an FLC because there has been no opportunity for dialogue in their departments" (p. 168). Cox describes various other trajectories faculty take, stressing that working through each phase is more important than the sequence in which the phases occur.

FLCs apply what we know about student learning to faculty. In addition to referencing various learning theories, Cox speaks to the issue of silence. Faculty, like students, are accustomed to doing their work independently and often do not feel equipped to reflect and talk about what they are doing. When the silence is broken, they operate on a dualistic belief that there is a right and wrong way to teach and defer to knowledge provided by outside experts. An FLC can help faculty come to the realization "that there are many different ways to teach and that these all can have positive learning outcomes" (p. 174). Moving through Weston and McAlpine's stages, faculty eventually come to a perspective that is based on critical thinking and allows for personal and contextual application.

In looking at the effectiveness of FLCs, Cox specifically addresses the impact on the SoTL. Out of 746 full-time and tenure-track faculty 40% participated in FLCs. More than half of these faculty "produced 'national' SoTL, defined...as a refereed presentation at a national conference or a national publication.... [In addition,] the percentage of FLC members who produce the SoTL increases with their participation in additional FLCs" (p. 177). In relation to student learning, Cox reports that in a survey to determine the impact of the FLC on faculty attitudes which result in a change in student learning, "scholarly teaching and the scholarship of teaching ranked second, with 92% of respondents reporting that students learned more because of the SoTL" (p. 178).

Cummins-Sebree and Wray (2013) describe a faculty development initiative that was designed to address critical thinking. Many community college students come to college without critical thinking skills, frustrating both faculty who expect students to have these skills and students who do not have these skills to use. As the lack of critical

thinking skills impedes success in academic endeavors and the workplace, the authors conclude that "it is imperative that two-year institutions consider the development of critical-thinking skills as a core mission in their education of their students" (p. 111).

The authors suggest "creating an interdisciplinary group that meets at least twice during each academic term" (p. 114) and indicate it is important to:

- designate a facilitator whose task is to organize the group; help members define clear objectives; establish processes; and collect and disseminate resources
- provide a stipend and budget for the facilitator
- secure administrative support so that faculty participation in the FLC is valued as professional development, and
- convince faculty that their investment will be worthwhile in terms of their own professional growth as well as having a positive impact on their students.

After establishing a meeting schedule, the authors suggest that the group clarifies expectations regarding commitment and agrees on a clear purpose. They found that this purpose is generally either based on a desire to "affect teaching and learning … [or] a combination of scholarly teaching and producing scholarship" (p. 116). Clarifying the purpose of the group determines the focus and process that will be used.

In this instance, the FLC began with a literature review. They discussed each article or book in terms of relevance to their discipline and instructional approach. When faculty implemented practices that came out of these discussions, they shared both the activity they tried and the results of that activity. They then received feedback from other faculty. Faculty who focused on scholarship shared their work for peer review as well, gaining insight from other faculty. The group eventually presented their work to the

larger faculty, "helping nonparticipating faculty reflect on their own critical-thinking activities… and [allowing] participants to be recognized by their peers" (p. 118).

In looking at models at other institutions, the authors found variety in both structure and purpose. Some were selective and provided a stipend as well as funding for resources. While many provided a financial incentive to faculty and the authors note that "facilitators should receive some sort of incentive or release time to handle the increased workload, and some funding for books or speakers would be helpful" (p. 118), they found that "dedicated faculty could run this type of FLC with little or no budget" (p. 118).

In summarizing the benefits of this FLC to faculty, Cummins-Sebree and Wray state that "in particular, it directly benefits their teaching and, consequently, student learning" (p. 119). Faculty expressly indicated the value of peer review, the fact that the "FLC helped to convey the institution's expectations for critical thinking" (p. 120), and the opportunity to develop presentations that added to their professional credibility. In addition, faculty found that the FLC provided motivation and persistence for professional development that they would not otherwise have attempted. The concrete changes made in their classrooms and therefore in student learning were clearly attributed to the peer review process in the FLC.

While most two-year colleges attempt to evaluate teaching effectiveness and provide faculty development, Denton, Sipple, and Cooper-Freytag (2013) contend that "they do not always define clearly what constitutes teaching excellence, nor do they always contextualize development opportunities in the larger framework of promoting scholarly teaching" (p. 42). Referencing the work of Boyer (1990), Shulman (2004), and Hutchings (2005), the authors contend that "if scholarly teaching is going to be made

public and evaluated so that formative feedback can be offered, the professionals conducting the evaluation must share some common sense of what constitutes teaching excellence" (p. 44). In addition, they note that peer observation only gives a snapshot and focuses on "effective lecturing or stage skills" which does not give the full picture. Citing Berk (2006) and Carnton (2001), the authors highlight the importance of self-reflection and peer feedback on that reflection in order to achieve quality formative evaluation.

Denton et al. describe an FLC designed to implement this approach to evaluation. The facilitators chose to create the FLC by inviting faculty from diverse disciplines and of diverse ranks, both full and part time. They structured the FLC around three days of meeting within one week, fully anticipating the relationships and mentoring would continue beyond the event. The initial FLC had no budget so participation was based on intrinsic motivation.

Each participant produced 3 separate guided self-reflections; one dealt with the syllabus, focusing on how the syllabus reflects one's philosophy of teaching; another dealt with a specific classroom strategy or activity that the individual believed represented his or her best teaching; the third dealt with assessment of student learning. For each topic, faculty exchanged self-reflections and provided feedback that was guided by specific questions. Each meeting occurred after one reflection had been written and reviewed; each provided time for participants to meet and exchange feedback as well as one or two whole group activities that added further insights to the topic of the day.

Faculty indicated that in addition to the FLC ameliorating the isolation faculty often feel, it "led to substantial reflection about teaching and learning by the participants as well as substantial changes in the classroom" (p. 51). Participants left with suggestions

and strategies that could be immediately implemented in their classrooms. In addition, the faculty who participated came to a "*shared* understanding of what constitutes excellent teaching in their institution" (p. 52). Finally, the authors found that this type of FLC "can contribute to the process of further professionalizing the two-year college professoriate" (p. 52).

Elzinga and Haynes (2013) state that in 2010 the American Federation of Teachers reported that 70% of community college instructors are part-time instructors. In an effort to improve the part-time faculty experience and connection to the department and the college, the Psychology Department at Columbus State Community College created an FLC that included both full-time and part-time faculty.

Key elements to success were determined to be:

- Good leadership – Facilitators were effective in developing community, serving as guides, and developing an atmosphere in which all faculty felt comfortable contributing.
- Departmental Support – Even though not all faculty were involved the FLCs made sure to take input from everyone and keep the department informed of their progress.
- Clear Policies and Procedures – Expectations were determined by the group and included frequency and duration of meetings, compensation, and attendance.

The group also chose its own curriculum. They spent half of each meeting sharing best practices and half working on group projects. The best practices section was preplanned in terms of who would present and how much time they would have for presentation. The group of 10 split into two project groups, enabling more participation. This format enabled faculty to learn from others' experience as well as providing the opportunity to work collaboratively on shared interests. The projects ranged from an

online departmental resource guide for part-time faculty to the creation of a support group for first generation students.

In order to build on the success of the first FLC, the FLC members presented to the department as a whole, highlighting the impact the FLC had on part-time faculty connectivity as well as on their classroom instruction. When attempting to expand the program, budget became an issue. The authors found that "if monetary compensation is nonexistent, then facilitators must depend on a creative approach while also relying on the intrinsic motivation of the part-time instructors" (p. 87). Another challenge was expanding the membership. Those who initially participated had accomplished the goal of connecting and those who had not participated were less likely to be interested.

Bond (2015) also addressed the use of FLCs with non-tenure track faculty. Convinced that use of non-tenured faculty will persist, Bond points to a need for professional development targeted to their unique needs (p. 1) and suggests that cohort-based FLCs meet these needs. His "qualitative case study examined the effects of a cohort-based FLC for non-tenure track faculty at a large (>35,000 students) university" (p. 4).

The FLC focused on the participants' top three goals "which were 'fostering colleagueship and learning from others,' 'developing increased individual teaching skill and ability,' and 'learning more about a specific pedagogical tool or strategy'" (p. 4). It met 6 times over the period of one year and covered six separate topics relating to classroom instruction. Of the 16 faculty members who participated in the FLC, 5 consented to participate in the study. Bond gathered data from "oral interviews, written evaluations, and physical artifacts" (p. 6).

In his analysis, Bond identified two major themes; the "cohort based FLC addressed participants' intellectual and emotional needs" (p. 7). In-depth analysis indicated that the FLC provided participants with the opportunity to learn new instructional techniques from interactions with other participants as well as from presenters. The opportunity for self-reflection added to this process. Emotionally, the participants indicated that the FLC helped them to feel more connection with other faculty, more supported by the institution, and more confident about their teaching.

Opening with the question "How frequently do faculty members have opportunities to engage in meaningful discussions about teaching?" (p. 174), Lynch and Cheatham (2013) describe a Teacher Scholar Inquiry Group (TSIG) designed to address pedagogical solitude. The group sought to build a community among faculty from four-year and two-year institutions. Ten faculty from diverse institutions participated in the group which met eight times a year.

The group determined its own format and focus. Lynch and Cheatham note that "anecdotal evidence suggests that food and casual meeting space contribute to the trusting environment needed for honest, in-depth discussions about teaching and its role within a research institution" (p. 180). At each meeting the focus for the next meeting or two was determined and readings were agreed upon; the group discussed the current reading; and time was allowed for personal reflection and journaling focused on how to apply what the participant had learned in the meeting.

Results of surveys indicate that participants benefited from taking away something useful to improve their teaching, the support of colleagues, and "the inspiration to take risks and assess the success of this risk taking" (p. 181). Using an

action research model pre, process, and post data was collected. The results indicate that "finding time for 10 busy individuals...to meet was the most significant challenge.... Ultimately, however, the facilitation of a highly motivated individual to coordinate the group's activities during the first year was critical" (p. 184). An effective forum was established because from the beginning it was clear that the group "owned" itself and established a shared vision of its goals. Along the way the group learned to be realistic about the quantity of material to be read. Significant group composition factors cited as important were that the group be "single-sex, multidisciplinary, multi-experience, and multi-age" (p. 185). The final point the authors make regarding lessons learned is the significance of the fact that "the facilitator hand-selected the members of TSIG based on her previous experience with the individuals" (p. 186).

In conclusion, Lynch and Cheatham summarize the success of TSIG by quoting one of the members who said:

> What the totality of this TSIG experience has meant for me in one word is...*change.* I have come away from this experience energized, determined, committed to do more and better, and, I think most importantly – to take more risks. (p. 187)

Weinbaum, Rodríguez, & Bauer-Maglin (2013), describe a model of professional development implemented as part of the Guttman Community College model that was built on learning communities for both students and faculty. The FLCs were established as instructional teams but

> like FLCs, the effectiveness of the instructional teams depends on developing a culture of collaboration and trust among the participants. As with FLCs, each instructional team ideally develops a distinctive community among its members

> …[and] participants must be willing to share both successes and failures and to learn from others so that faculty can make changes on an ongoing basis. (p. 3)

The Guttman Community College model is somewhat unique in that "faculty are full-time and have been hired not only because of their disciplinary background but also because of the commitment to implementing the model" (p. 5). The faculty and student support advocates (SSAs) meet weekly to "make all the decisions about the teaching and learning in their house and needed supports for students" (p. 5). They "had to develop a structure for collaboration at the same time as they were implementing a new curriculum and new approaches to pedagogy and assessment" (p. 6).

Math was the one discipline that did not participate in the instructional teams. Math also was the only course that varied in length based on the student's level of proficiency. This fact was one criticism made of the instructional teams by their own members. The issue is being addressed as the program progresses: "What is significant is that instructional teams approached issues... differently" (p. 10). "All the SSAs and faculty agreed that in the first semester getting students to understand the college's emphasis on learning, completing work, and developing analytical thinking was a steep climb" (p. 14). As there were no developmental classes and 15% of the cohort was made up of students with disabilities all "faculty needed to learn how to scaffold assignments for students, how to think about grading in terms of student progress and development while maintaining high standards of performance, and how to figure out the amount of effort they would expend in following up on students who were reluctant or disengaged" (p. 15).

Teams discussed strategies to understand and reach students. Community was built and students were encouraged to get help with any conflicts that arose. In evaluating

the year, faculty indicated that the team helped them to do a better job as there was support and mutual guidance. Faculty also came to depend upon one another, utilizing each person's strengths.

The collaboration of the instructional teams provided support in affective areas as well as academic areas, by both supporting one another and strategizing ways to better support students. Sharing teaching strategies enriched each faculty member's instructional practices and the opportunity to explain the rationale behind teaching strategies allowed for self-reflection as well as peer feedback. Some faculty established online portfolios where artifacts could be shared. All utilized text messaging for communication and support.

In analyzing FLCs, Ortquist-Ahrens and Rorosyan (2009) contend that the role of facilitator is key to success. They found that a facilitator "must find ways to help establish a climate conducive to genuine inquiry, risk-taking, learning, and productivity" (p. 32). As neither a subject matter expert nor the person in charge of the FLC, a facilitator must serve the interests of the group rather than his or her own interests.

As indicated in Table 1, Ortquist-Ahrens and Rorsyan found that faculty perceived participation in FLCs to be much different from participation in committee work. They saw the FLC as an opportunity for "exploration, growth, and a rewarding, deep sense of collegiality that committees, often did not. Genuine inquiry, the freedom to explore, and collaboration were at the heart of the experience" (p. 36). Faculty reported that, in contrast to their feelings about committee meetings, they looked forward to FLC meetings.

Table 1: *Sample Learning Community Self-Analysis with Defining Features Matrix*

COMMITTEE	FLC	BOTH
Charge	Shared goal	Meet regularly
Minutes	Notes	Agenda
Mechanical, impersonal	Creative, personally meaningful, chance to explore	Outside work
Chair does work, hierarchical	All share responsibility; collaborative	Cross-disciplinary
Driven by bureaucracy	Driven by genuine inquiry and curiosity	

Source: Adapted from "The Role of the Facilitator in Faculty Learning Communities: Paving the Way for Growth, Productivity, and Collegiality," by L. Ortquist-Ahrens, and R. Torosyan, 2009, *Learning Communities Journal, 1*(1), p. 36.

Ortquist-Ahrens and Rorsyan identify attitudes and capacities that are requisite for a facilitator to build this type of FLC. The facilitator must be willing and able to remain detached enough from the content of discussion to attend to group process. The facilitator must also take care to share responsibility for the group with either a co-facilitator or group members who take on leadership roles. The authors provide specific suggestions for facilitating good communication and for handling challenges and conflicts that inevitably arise. They also describe a process for developing an FLC, outlining common stages of development.

An aspect of faculty development that is just beginning to be examined is that of mindset. Heggart (2015) indicates that growth and fixed mindsets "impact upon our understanding of success and failure. Fixed mindset people dread failure, feeling that it reflects badly upon themselves as individuals, while growth mindset people instead embrace failure as an opportunity to learn and improve their abilities" (para. 5).

Heggart describes 4 strategies to consider when instilling a growth mindset in faculty. Citing Gerstein (2014), Heggart suggest professional development opportunities

that encourage faculty to clarify that they, as well as their students, are learners and provide them with resources to help them model, as well as explicitly teach, their students about the growth mindset. Heggart also indicates that faculty need "opportunities … to try new things and make mistakes" (para. 15) as well as time to "reflect upon their new ideas and consider what they learned from the process … whether the idea was a success or a failure" (para. 17). Finally, the value of process as promoted by the growth mindset must be supported in the faculty evaluation process; making feedback "formative, rather than summative, and inviting participation of the teacher in the process (para. 19).

CONCLUSION

A review of the literature reveals current concern about developmental and general education math instruction at the community college. There is some consensus that, for students to reach required mathematical competency for college and the workplace, general education and developmental math courses need to utilize new instructional methodologies rather than depend on traditional lecture and skill drill pedagogy. Research indicates that FLCs can be an effective means of supporting faculty when attempting to implement new approaches to instruction.

Chapter 3: Creating the Guide

INTRODUCTION

This chapter will describe the process used to create the product presented in Chapter 4. The product is a guide designed to assist departments or institutions in developing training and support for part-time developmental or general education math faculty who have been asked to implement innovative instruction. The product was informed by findings from questioning part-time faculty who have implemented innovative instruction, observations and feedback from a Faculty Learning Community (FLC) piloted with part-time math faculty, and insights from relevant literature. The process for gathering these insights as well as the findings are described in this chapter.

QUESTIONNAIRE

A questionnaire (Appendix A) was developed to gather input from part-time developmental math faculty who had been asked to implement new teaching strategies. Permission was granted for the questionnaire to be distributed to part-time faculty at a large urban community college that had recently implemented a new instructional methodology. This new program required developmental math faculty to utilize an online learning system rather than a traditional textbook.

Emails were sent to the 8 faculty members who had volunteered to implement this new program. The email explained the purpose of the questionnaire was to gather feedback to inform a guide that could be used to train and support part-time faculty when

they are requested to implement a new instructional methodology. All 8 faculty responded that they were willing to participate. The faculty were provided a consent form (Appendix B) and opportunity to ask for clarifications or to address concerns. After completing the questionnaire, faculty placed it in an envelope in order to maintain anonymity.

While the sample size was small, the questionnaire was not intended to be used for a quantitative study so it was determined the sample size was adequate for its purpose. It was also recognized that, as the faculty had all volunteered to teach with a new methodology, the sample was likely biased. Again, as the feedback received was intended to inform the product, rather than as a quantitative study, possible bias was noted but was not of serious concern.

Three sections of the questionnaire were most relevant to the design of the guide. The first relevant section, *Hesitance to Change*, addressed potential resistance to change. Participants were asked to list reasons they might be hesitant to change their method of instruction. The second relevant section, *Reflections on Previous Training,* asked participants to reflect on previous training to determine what aspects had been, or would have been, helpful when they were asked to implement a new teaching methodology. The third relevant section, *Strategies for Training*, presented 18 elements that could be incorporated in a training and support model. Participants were asked to rank these items in terms of importance. What follows is a summary of responses for each of these sections, insights gained, and implications for designing the guide.

Participants were asked to list reasons they would hesitate to change the way they teach. All 8 participants responded to this section. The small sample size precludes making conclusive statements. As previously indicated, the intent was not to draw conclusions but to use faculty feedback to inform the product.

Table 2: *Top 5 Reasons for Hesitance to Change*

IMPACT THE CHANGE MIGHT HAVE ON THE INSTRUCTOR	IMPACT THE CHANGE MIGHT HAVE ON STUDENTS
• New method might be incompatible with personal style (3) • Amount of time required to implement something new (2) • Concerns over personal energy level (1) • Fear of failure (1) • Stress (1) • Authority - note on side indicates "I do changes little by little" (1)	• New method might not incorporate current strategies that have proven to be successful (3) • New method might not allow time to help students individually (2) • Will it cost students more? (1) • Is it racially and ethnically diverse? (1) • Will it exclude some students? (1)

Note. The number following each response indicates the how many participants indicated the same concern.

Table 2 reports faculty responses based on whom the change might impact. The responses indicate that faculty have different perspectives when explaining their hesitations. Responses fell into two distinct categories: impact of change on the instructor and impact of change on students. Four participants gave responses that solely related to the impact the change would have on themselves; one participant gave responses that solely related to the impact the change would have on students; three participants gave responses that fit both categories. As the table indicates, reasons faculty may hesitate to change the way they teach are varied.

The responses faculty listed were useful; they gave the author a sense why faculty may hesitate to change their instructional practices. Understanding this hesitation is important if a training program is to make an impact on faculty practices. A key element to successful implementation of change is overcoming resistance (McCarthy, 2009). Understanding reasons for faculty hesitation enables those implementing the change to address faculty concerns. Designing ways to recognize and address both common and unique concerns when implementing change were therefore addressed in the guide.

PREVIOUS TRAINING

The questionnaire included a list of 15 training activities; participants were asked to reflect on previous training, indicate if these activities had been used and how helpful they found each activity. Four of the 8 participants completed this section. Two participants based their responses on their experience of being trained to implement computer assisted instruction and two participants based their responses on their experience of being trained to increase student engagement and cooperative learning.

As Table 3 indicates, the same training was not provided to all participants. While little can be concluded from these responses, they do suggest there may be inequity in training opportunities. This could point to the value of formalizing training and support for part-time faculty so that all are offered the same resources.

Table 3: *Helpfulness of Various Training Strategies*

	TO IMPLEMENT STUDENT ENGAGEMENT STRATEGIES		TO IMPLEMENT COMPUTER ASSISTED INSTRUCTION	
Strategy	Helpful	Not Provided	Helpful	Not Provided
One-on-one training	1	1	1	1
Sent to a training	1	1	1	1
In house training	1	1	2	
Follow up trainings	1	1	1	1
Assigned a mentor	1	1		2

Of the strategies listed, there was consensus that the following had been, or would have been helpful:

- Using part-time faculty input when designing a change
- Asking part-time faculty for feedback after implementing the change
- Providing part-time faculty with both printed and online resources
- Observing an experienced instructor
- Having an assigned mentor

Those perceived as "not very helpful" were:

- Printed explanatory materials
- An opportunity for ongoing discussion of the change
- Information about results once the change had been implemented

STRATEGIES FOR TRAINING

Participants were also asked to rank 18 training strategies. Table 4 details the degree of importance participants assigned to each of the 18 strategies. The first column indicates the percent of participants who included the item in their top eight choices. The second column provides the wording of the strategy chosen as being important. As one participant did not include any ranking, these insights are based on the 7 participants who used some form of a ranking system. Only strategies that were highly ranked by more than 40% of the participants are included in the table.

Table 4: *Percent of Participants Including Strategies in Top 8 Strategies Important in Training*

%	STRATEGY
100%	An explanation of why the change is being made
86	A mentor who I can call on throughout the change process
86	Lots of lead time before the change occurs
86	Demonstrations given by an instructor experienced with the change
86	Data supporting positive outcomes of the change at other institutions
71	An initial orientation followed by several training sessions
71	A thorough orientation/initial training
57	Informal opportunities for discussion during the implementation of the change
57	Background on how the college/department came to the conclusion this is needed
57	Incremental change; allow me to ease into the change
43	Data supporting positive outcomes of the change at your own institution
43	Observation and feedback of me implementing the change
43	An opportunity to give feedback on how the change is working in my classroom(s)
43	Being provided all materials needed for the change – a total package so I don't have to create a syllabus, homework lists, quizzes, tests, etc.

As with the previous sections, this question was not intended for a quantitative study; it merely served to inform the product. The small sample size and likely bias were taken into account when determining what might be important for the product. As all participants indicated it was highly important to explain why the change was made, this was emphasized in the product. Other strategies with high percentages were mentioned briefly.

SUMMARY OF QUESTIONNAIRE FEEDBACK USED TO DEVELOP THE GUIDE

A review of themes emerging from the questionnaire suggested the importance of including the following elements in the training and support guide:

- Clear communication to explain why the innovation is being implemented
- Evidence indicating the innovation will positively impact student learning

- Inclusion of part-time faculty when designing the innovation
- Opportunity for faculty to incorporate their personal style when implementing the innovation
- Opportunity for faculty to incorporate strategies that have already proven to be effective
- Adequate time to implement the innovation
- Provide both printed and online resources
- Opportunity to provide feedback about the innovation after implementation has occurred
- Provide a mentor
- Provide the opportunity to observe an experienced instructor

PILOT FACULTY LEARNING COMMUNITY

To more fully understand the workings of a Faculty Learning Community (FLC) the author ran a pilot FLC with part-time developmental math faculty, observed its functioning, and solicited feedback from the participants. This first-hand experience and feedback from FLC participants was intended to enhance the author's understanding of the dynamics involved in implementing and sustaining a Faculty Learning Community.

Participants

The FLC was scheduled to run during Winter Semester of 2016 at a large urban community college in the Midwest. Participants were self-selected from the convenience sample. As the focus of the study is part-time faculty, only part-time faculty were included in the sample. An additional intent of this restriction was to create an environment in which participants felt safe to be open and contribute to the work without concern about being evaluated or directed by full-time faculty.

To narrow the focus of the FLC, the invitation was further restricted to those assigned to teach Basic Math and Pre-Algebra. The ability to focus on a specific course was important, as the intended model will be designed to focus on a specific course or implementation of specific instructional strategies. At this institution, Basic Math and Pre-Algebra are taught as either a two-semester sequence or as a combined course in one semester so would provide a specific focus for the group.

In addition, all but one of these instructors had taught the same courses for at least 5 years. Having worked together previously and having experience with the same course would provide a sense of familiarity. It was hoped this would allow for an initial comfort level in order to quickly develop a comfortable working relationship which is key to the success of an FLC (Bickerstaff, Lontz, Cormier, & Lu, 2014, Cox, 2003; Cummins-Sebree & Wray, 2013; Daly, 2011).

Invitation

As part-time faculty are not assigned to courses until a month prior to the start of the semester, potential participants were not informed of the opportunity to participate until the final week of Fall Semester. The invitation to participate indicated that as part of the researcher's dissertation work she was organizing a Faculty Learning Community (FLC) to address issues of common concern among instructors who teach Basic Math and Pre-Algebra courses (Appendix C). It included a brief description of the philosophy behind FLCs, the benefits of participation, and the amount of time that would likely be involved. The invitation clarified that the researcher would not only organize and facilitate the group but would also observe the group as part of her dissertation work. Those who were interested were invited to contact the researcher personally for more information.

The invitation was sent to 13 part-time developmental math faculty who were assigned to teach Basic Math and/or Pre-Algebra during the winter semester of 2016. Six faculty responded; two were definitely interested; two were interested depending upon timing of the meetings; and two were not interested. During casual conversation two additional faculty indicated an interest in participating. As both had previously taught these courses and would likely teach them again, it was agreed among those already involved that these new faculty should be added to the group.

Organizing the FLC

Initially it was difficult to schedule a meeting time. To expedite the process the author met with several members individually to explain the intent of the FLC, the extent of commitment that would be required, explain the consent form and acquire official consent from them (Appendix D). After obtaining each member's schedule, a meeting time was determined. All agreed that a weekly meeting would be appropriate, as less frequent meetings might cause the group to lose momentum. To provide a convenient, comfortable meeting space the conference room in the math department was reserved.

In order to engage the participants and establish an autonomous learning community, the author encouraged the group to determine what the focus of the group would be. (Cummins-Sebree & Wray, 2013; Daly, 2011; Elzinga & Haynes, 2013; Lynch & Cheatham, 2013) Only three members were present at this meeting. One member suggested discussing Jo Boaler's book, *What's Math Got to Do with It?* Another member was concerned about students retaining what they learn and suggested that might be a topic for discussion. The author (as participant) was interested in learning how to better teach conceptual knowledge; she also suggested Boaler's book or her more recent book, *Mathematical Mindsets: Unleashing Students' Potential through Creative Math,*

Inspiring Messages and Innovative Teaching. In addition, she made the suggestion of a video series available on YouTube in which Jo Boaler presents much of the same content. As Boaler's work would likely address the issue of students retaining what they learn, and the group felt that watching videos might be more realistic than reading a book, they chose to use the video series *How to Learn Math for Teachers and Parents* as the focus of their discussion.

Several members indicated that due to erratic schedules their attendance might be inconsistent. The notion of creating an online venue for asynchronous discussion was suggested. A member volunteered to work with the college's IT department and to establish an online course management platform which could be used as a place to discuss and post additional resources.

Expanding the FLC

As the FLC seemed rather small, and the topic chosen could be applicable to all courses, the group decided it might be wise to open participation to all part-time faculty in the math department. The author sent a second email to all 64 part-time math faculty teaching that semester as well as those who had taught in the fall and were likely to teach in subsequent semesters. The email described the FLC, the focus of its study, and the fact that the author would be studying its dynamics and work. Expecting scheduling issues, the invitation included the option to participate in solely the online portion of the discussion. Interested faculty were invited to contact any of the FLC members. There was no additional interest. This lack of interest was later explored as part of the feedback process.

Use of Online Course Management System

A member of the group worked with the IT department to establish an online platform for announcements and discussions as well as a repository for documents. The platform was designed to provide a place for announcements, information, and discussions. All members were registered as leaders, allowing them to add announcements and information and begin forums for discussions. This technical structure allowed for shared leadership in the virtual space.

The Participant Observer Facilitator

As the author was a participant and an observer and served as facilitator, but did not want to dominate the group, she was extremely careful to defer to group members whenever possible (Ortquist-Ahrens and Rorsyan, 2009). All group members were competent and confident, requiring little facilitation. She was able to allow others in the group to direct discussion and assume some responsibility for logistics. As observer, she took notes regarding both the content and process of discussion but as participant, at times she became engrossed in the discussion and found it difficult to maintain the observer role.

To mitigate this concern and ensure the most complete recall of each meeting, the author recorded reflections as soon as possible after each meeting. These reflections were recorded in two tracks; one track consisted of reflections on the group dynamics and the other on the content discussed. In addition to these immediate reflections, the author reviewed the notes at a later date to add additional thoughts and comments. Finally, at the conclusion of the FLC, the author validated her conclusions by comparing her observations with feedback given by each of the participants.

Summary of the FLC: Process, Dynamics, and Content

The FLC met weekly for one 15-week semester. The first two weeks of the semester were spent recruiting members and organizing the group. The last week of the semester was scheduled for a feedback session. The group did not schedule a meeting during semester break, one meeting was cancelled as the campus was closed due to inclement weather, and one meeting was cancelled due to schedule conflicts. Regular meetings were held the remaining weeks for a total of 9 meetings.

The first five meetings focused on videos presented by Jo Boaler as part of a course titled "How to Learn Math for Teachers and Parents." As the videos were designed to be used in an online course and addressed issues relevant to the participants, these meetings were productive, discussion was focused, and all participants were actively engaged. During this time the college was closed due to inclement weather but participants were able to continue discussion via the online course management system.

As all participants were engaged and found the discussion relevant, the researcher did not need to focus on facilitating discussion, nor did she need to intervene in any negative group dynamics. The group self-monitored, included all participants in discussion, and established ongoing goals for future meetings.

During this time, discussions were based on content from Jo Boaler's YouTube videos. Concepts covered included:

- the danger of emphasizing speed in math
- tension between conceptual understanding and memorization of procedures
- the myth of "math people" and "non-math people"
- gender bias in math instruction
- the concept of neuroplasticity and how to communicate it to students

- Carol Dweck's work with growth and fixed mindsets and how mindset impacts learning math, including how to share this with students
- the value of mistakes, how to learn from mistakes, and how to create a mistake friendly classroom

As a result of discussion, participants began planning how to include these concepts in their instruction. A group member brought a resource used by another faculty member to help students analyze mistakes on tests. Another group member showed a Jo Boaler video to her students and used it as the impetus for a free-write activity about dealing with mistakes; students' writing indicated the video had made a positive impact on their thinking about mistakes being valuable to learning. Two group members reported concrete examples of changes in their own behavior when students made mistakes in class, challenging students to think through their mistakes rather than giving them the correct answer.

Discussion about growth mindset prompted all participants to begin thinking about how to incorporate this into their course design. One participant purposed to find videos that could be used to communicate these concepts to students and post them for others to use in the fall. All participants reflected on the type of praise they tend to give students, indicating they had become more aware of the need to praise effort rather than performance and speed. One participant commented that the videos caused her to reflect that sometimes it is not about the math; it is much bigger than the math. It is about helping students get past their attitude or mindset.

The next section of videos focused on the importance of conceptual thinking, how to build conceptual understanding, and how to appreciate algebra. At this point, the videos were removed from YouTube as Stanford is now offering the course through their Center for Professional Development. Loss of access to the videos changed the group

process. The change was compounded by time constraints for participants; one participant began working 2 additional jobs and another began having conflicts due to her job at the college. Attendance became more sporadic.

Although attendance was less consistent and loss of the videos presented a challenge, the group continued to make progress. The discussion about mindset and learning from mistakes evolved into a focus on finding ways to help students become self-regulated learners. Two participants worked on developing syllabus language to promote self-regulated learning. They also began developing a reflection protocol for students to use when evaluating mistakes made on tests.

In addition to this work, the group began focusing on how to help students develop conceptual understanding. One Jo Boaler video that was still available on YouTube focused on use of number talks. A group member found several articles that addressed how to teach students to understand multiplication of fractions. Another group member shared work she was doing to develop a resource to help students better understand equivalent fractions. These resources prompted discussion regarding use of visual representations in addition to algorithms when explaining mathematical procedures.

The meetings toward the end of the semester were less structured and less well attended; several times there were only two people present. The two consistent participants continued to work toward creating resources that could be used to implement ideas that had been discussed throughout the semester. When the other members were able to attend, they easily joined into this work, contributing fresh perspectives. Neither the quality of discussion nor productivity in terms of work completed seemed to be

impacted by the size of the group. Those who attended less frequently were equally engaged in applying content to their instruction.

Findings from the Pilot FLC

In addition to her own observations, the researcher interviewed each participant to determine what findings from the experience should be incorporated in the model. The following themes emerged:

- Recruiting part-time faculty to participate in a Faculty Learning Community can be difficult. Of the 64 potential part-time faculty, only 4 committed to participate. Participants commented on this, wondering if faculty don't see a need to improve their instruction or if perhaps recruiting during fall semester would result in a larger response. One participant noted that she had time to participate because she only teaches at one institution and has no other job; many part-time faculty have full-time jobs or teach at several institutions. One participant wondered if external incentives would result in a better turn out. All expressed appreciation that those involved were internally motivated resulting in quality engagement.
- Limiting participation to part-time faculty was important. While other institutions may have a different climate, at this institution there is a sense that full-time faculty are in charge and part-time faculty are reluctant to be open with their opinions, deferring to full-time faculty. Full-time faculty also tend to focus on departmental or programmatic needs while part-time faculty prefer to focus on the specifics of their own immediate classroom instructional needs. One participant mentioned that if the tone could stay collaborative it would be okay to include full-time faculty.
- A safe, collaborative environment was important. Participants all indicated that they felt everyone in the group was "on the same page." They felt comfortable sharing frustrations and failures; in other departmental situations they do not feel this level of comfort.
- Two different perspectives about size of the group emerged. The small size of the group allowed participants to focus on more specific individual needs. As the 4 participants shared similar philosophies the group ran smoothly. A larger group would provide more input and varied perspectives. This might be valuable but might also introduce more conflict. One participant suggested that a larger group might be divided into smaller workgroups, allowing participants to focus on varied topics, then report back to the larger group.
- Frequency of meeting preferences differed as well. Weekly meetings provided opportunity for immediate support and feedback. Meeting every two weeks would be less demanding and would provide more time between meetings for reflection and opportunity to implement strategies. One participant suggested the possibility of varied meeting times; this might allow for more participation.

- Location of meeting needs to be considered. It was assumed that convenience was most important but one participant suggested that perhaps meeting outside of the math department might make participants feel less conspicuous and contribute to the sense of a safe space. This might result in more candid discussion.
- Participants hoped to become better instructors. All of the participants indicated they hoped the FLC would help them improve their instruction, become aware of and implement new strategies, and impact future instruction. Their focus was on change and improvement, not simply gaining information. They wanted something they could use.
- Use of videos was very valuable. When the group lost access to the videos it became more difficult to participate without attending. Having shared content to review, discuss, and implement made the work easier. Videos from an expert provided validity to the content; relevance of the videos to felt needs of participants enhanced engagement.
- In addition to discussing instructional approaches, the FLC provided emotional support, an opportunity to vent and share frustrations, and validation that participants were not alone in their struggles. It provided support which produced courage and motivation to change, and accountability to follow through on intended changes.
- Providing an online venue for sharing ideas and resources was valuable. During the FLC the online course management system was helpful for sharing articles and classroom resources. Continuing to use this would enable part-time faculty to share ideas and resources; sharing strategies, handouts, videos, etc. saves time and makes implementing new strategies less intimidating.
- Participants did not use the online course management system as much as they would have liked. The idea was a good one but they tended to forget it was available. They received notices of new announcements but it would help to find a way to notify participants of new additions to the discussion board as well.

RELEVANT LITERATURE

In addition to findings from the questionnaire and the pilot FLC, the author drew insights from current literature. While the literature supporting the need for innovative instruction in developmental and general education math courses was not directly used in developing the guide, it supports the value of the guide and was used to frame the need for training and support of part-time math faculty as part of the guide's introduction. The

impact part-time faculty have on the issue was also included in the introduction. Specific needs of part-time faculty were addressed as appropriate throughout the guide.

Webster-Wright (2009) reframed professional development (PD) in terms of professional learning. This work was the basis for the guide's focus on the importance of designing an opportunity for professional learning that can replace or augment traditional PD offerings. Professional learning is fostered by a process that allows for contextualized collaboration with opportunity for reflection, application, and support. Based on this, the guide recommends that a training and support initiative use the Faculty Learning Community (FLC) model rather than relying solely on a traditional type of training event. This approach was supported by literature addressing faculty attitudes toward professional development (Daly, 2011).

The portion of the guide that outlines elements to include when designing an FLC was based on the following insights:

- Clearly define the group's goal; design structure based on the goal (Cummins-Sebree & Way, 2013; Elzinga & Haynes, 2013)
- Create a safe environment (Bickerstaff, Lontz, Cormier, & Xu, 2014; Cox, 2003; Cummins-Sebree & Wray, 2013; Daly, 2011; Weinbaum, Rodriguez, & Bauer-Maglin, 2013)
- Establish group autonomy (Daly, 2011; Elzinga & Haynes, 2013; Heppner & Kaufman, 2013; Lynch & Cheatham, 2013)
- Provide time and opportunity for reflection (Bickerstaff, Lontz, Cormier, & Xu, 2014; Bond, 2015; Denton, Sipple, & Cooper-Freytag, 2013; Heggart, 2015)
- Recruit an effective facilitator (Cummins-Sebree & Way, 2013; Elzinga & Haynes, 2013)
- Provide adequate departmental and institutional support (Cummins-Sebree & Way, 2013; Elzinga & Haynes, 2013

CONCLUSION

This chapter described the process used to collect information that was used as a basis for the product that is presented in the next chapter. Feedback from faculty who had implemented innovative instruction, insights from a pilot FLC, and relevant literature were combined to inform the final product. The product was designed to help train and support part-time faculty implement innovative instruction in developmental and gateway math courses. This product takes the form of a guide and is presented in Chapter 5

.

Chapter 4: The Guide

INTRODUCTION

As indicated in the previous chapters, the goal of this dissertation project was to create a product that can be used to assist those who need to train part-time developmental math faculty to implement innovations in instruction. This need may take various forms. Part-time math faculty may need to learn a new approach to instruction as they implement computerized modules in developmental or general education levels of math. In order to teach a class built around inquiry based learning, faculty may need to develop new teaching methods. Faculty may be asked to improve instruction by incorporating current best practices that promote student engagement and/or deeper conceptual understanding; they may need training and support in order to be able to implement these innovations.

GUIDE DESIGN

As needs vary, the product has been designed to be adaptable. Rather than a model or program for training and support, the product has been designed as a guide. Depending on one's needs, various sections of the guide may be useful. Rather than spelling out steps to be followed, the guide provides suggestions and issues to be considered when developing a training program. Throughout the guide readers are encouraged to stop and discuss how they will apply suggestions and recommendations. Space is provided to record notes. The workbook format is intended to assist readers in designing their training and support program.

CONCLUSION

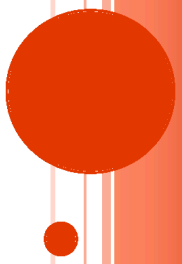
What follows is the guide itself. It has been designed as a stand-alone product, and includes internal pagination for the Guide as well as the sequential pagination of this dissertation. Thus, page 2 (page 77) of the Guide contains the Table of Contents for the Guide, and all visuals within the Guide are cited and referenced internally. Also, to minimize visual interference of in-text citations, the author opted to use Turabian Endnotes rather than APA citations. Following the Guide, Chapter 5 presents considerations for use of the guide and recommendations for further research.

Using Faculty Learning Communities To Help Part-time Faculty Improve Developmental and Gateway Math Courses

A Guide

This guide has been designed to help you train and support part-time math faculty who have been asked to implement innovative instructional practices in developmental and general education math courses.

Dr. Barbara L Bouthillier



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The need for innovative instruction in postsecondary math:

By 2018, "U.S. businesses will need an additional 140,000-190,000 employees with 'deep analytical talent' and a high level of quantitative skills." [1]

"Projections show that by 2020 65 percent of the jobs will require postsecondary education and training beyond high school."[2]

Community colleges are facing the challenge of preparing students to develop "cognitive strategies such as analysis, interpretation, precision, accuracy, problem solving, and reasoning . . . for success both in post-secondary education and the workplace."[3]

Recent reports estimate that 42% of students hoping to obtain a post-secondary education are unable to do so because of math requirements.[4]

INTRODUCTION

Community colleges are facing a serious challenge. Students continue to come to college underprepared, yet there is a growing need for a workforce with post-secondary education. Math requirements are a major barrier to many students and community colleges are attempting to find ways to remove this barrier.

As part of what is called the completion agenda, community colleges are implementing various initiatives, including better math placement tools, wrap around academic supports, accelerated math sequences, and revision of math curriculum.

This revision is in response to a call for program specific options for math courses, now called math pathways.[5,6] These pathways offer preparation courses specific to statistics or quantitative reasoning in addition to the traditional algebra pathway to calculus. Many colleges are revising curriculum and offering new courses at both the developmental and general education levels.

As curricula are revised, best practice models are published and pilot programs are run. Those that prove successful are adopted at other institutions. These institutions then face the challenge of bringing programs to scale. New courses often require a change in instructional approaches. As approximately 70% of community college faculty are part-time faculty,[7] scaling up successful strategies requires training and supporting part-time faculty to implement these innovations.

The Guide

This guide is intended to be a resource for training and support of part-time faculty. Its specific focus is part-time faculty who teach developmental or general education math courses, but for simplicity will refer to the audience generically as "part-time faculty" or simply "faculty". The suggestions presented could apply to full-time faculty as well and recommendations could be applicable to other disciplines. However, as part-time math faculty have a unique perspective, the guide is tailored to those specific needs.

To create this guide, the author questioned faculty who had been asked to implement an innovative instructional approach. She also facilitated a Faculty Learning Community (FLC) of part-time developmental math faculty and collected feedback from them. Results from the questionnaire and feedback from the FLC were combined with insights from current literature to develop the guide.

As a guide, it provides suggestions for developing a training and support program but does not presume to provide a complete model. As each institution and each innovation present unique considerations, it does not hope to present an elegant solution. Rather, it raises questions and makes suggestions to guide you through the process of creating a training and support initiative appropriate for your situation.

It is designed to be used with a team. After a brief presentation of insights from current literature, the questionnaire results, and FLC feedback, the guide is formatted as a workbook. It presents the elements of an FLC that you will need to address, suggestions for ways to address these elements, and then provides space for notes and questions for your team to answer as you determine how to build a program that meets the needs of your institution. The worksheet on page 23-24 provides a place for you to keep track of your notes as you work through the guide. You may want to remove or duplicate it for convenience.

From Professional Development To Professional Learning

When we consider developing training programs for faculty, we typically think about professional development (PD). This generally means seminars, workshops, retreats, or conferences. Most often PD involves a speaker or several speakers who bring new ideas or present best practices for instruction. The event may involve some breakout sessions, or include strategies for engaging participants, such as pair and share, small group discussion, or simulated practice. The focus is on delivering content.

As you begin to think about training faculty to implement innovative instruction you need determine if traditional PD is the best approach. Consider reframing PD as professional learning (PL); this may help you to develop a more effective experience for faculty.

> While PD can be used for many different purposes, the focus of PL is learning that leads teachers to "develop 'new understandings' about their own practice." (Webster-Wright, 2009)

PD is based on the notion that what is to be learned can be packaged and delivered in some sort of event. From we know about learning, it is not that simple. The focus of PL is authentic learning that "continues over the long term and is best situated within a community that supports learning." This type of learning is contextualized; for faculty the context is usually their own classroom. It requires time and a safe learning environment. It is a process rather than an event and requires commitment on the part of the learner. [8]

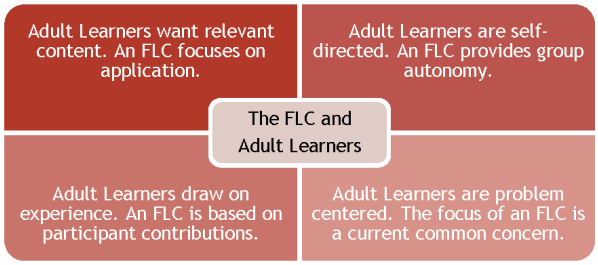
As you move forward to plan your training program, consider your focus. If innovations in instruction are to take hold and be sustained you will want to make sure you are focusing on PL, providing an opportunity for faculty to truly develop new understandings and make the appropriate changes in their instructional behaviors. Teaching is not content that can be delivered; teaching is a practice and practice requires context, time, commitment and reflection.

Rather than traditional PD, consider using a Faculty Learning Community.

What is a Faculty Learning Community?

Briefly stated, a Faculty Learning Community (FLC) is a group of faculty who choose to work together to address an issue of common concern related to teaching and learning. The focus of an FLC is on personal application of learning, specifically application to instructional practices. An FLC meets regularly, generally for at least one year, and is committed to a specific focus or goal. A facilitator helps the FLC determine this focus and manages logistics to ensure productive movement toward its goal.

The FLC model is consistent with what we know about adult learners.[9]



Let's further clarify what an FLC is - and what it is not:

An FLC is not:	**An FLC is:**
A program, an event, or a training	A process; an ongoing cycle of learning, application, reflection, and evaluation
A committee meeting	A community of faculty working together toward a common goal
A book club or discussion group	A community committed to support one another as they implement new learning

The rest of this guide is designed to help you work through the process of creating an FLC designed to meet the unique needs of your situation.

What is important to part-time faculty?

After being trained to implement a new program, part-time developmental math faculty were asked what they perceived to be the most important element of a training program. The #1 answer was:
"An explanation of why the change is being made."

Part-time Faculty who are hesitant to implement new strategies want to know that the change will:

- *Benefit students*
- *Allow faculty to use strategies that they know work*
- *Allow for personal style*
- *Allow time to help students individually*

They also fear the change will:

- *Require too much time to prepare for*
- *Be too stressful*
- *Result in failure*

Considerations When Getting Started

Do you have the luxury of beginning this new initiative with part-time faculty?

If yes: Set up an FLC with that focus in mind.

If no: Consider how part-time faculty can be involved in the process of selecting and/or approving the innovation to be implemented.

Consider: Which of your part-time faculty

- is enthusiastic about innovation?
- tends to be oppositional?
- has the most influence with other faculty?

Something to think about:
Our tendency would be to invite the most enthusiastic faculty to participate and avoid those who are oppositional. However, an oppositional faculty member may be displaying critical thinking skills that are valuable in evaluating options for implementation.

If you are serious about including part-time faculty in the decision making process, make certain you consider their schedule(s) when establishing meeting times, consider the option of some sort of remuneration for their time, and make certain to honor their perspective.

You may have already determined the innovation to be implemented or may be unable to include part-time faculty in the decision making process. If this is the case, when introducing the innovation plan be certain to include:

- an explanation of why the change is needed
- a clearly articulated rationale for implementing this particular innovation

Using a Faculty Learning Community

At this point stop and determine how an FLC will fit in your training program. Here are some options to consider:

- An FLC will be used to begin the whole process. (The focus of the FLC will be to determine what your college needs and either design or find an instructional model that could meet that need.)
- An FLC will be used for faculty who already have ideas that they would like to implement in their instruction. (This does not have to be applied to all faculty. However, often once this begins and FLC participants share what they are doing you will likely find more faculty want to be included.)
- There is a course at another institution that we want to replicate. (You may want to start with a PD event that introduces that course. From there you can form an FLC of those interested in being part of the implementation team.)
- We have already implemented a course and need to scale it up but do not have faculty who are adequately prepared. (You will want to form an FLC including experienced part-time faculty with those who are new to teaching the course. Remember that one of the elements of an FLC is application of new learning so be careful about including those who are not yet teaching the course unless there is some way for them to apply what they are learning.)

Based on your situation, determine how an FLC will fit into your training/support program. This might modified as you work through the rest of the guide. All you need is a place to start. Add your notes to the worksheet on page 23-24.

Making Sure You Have Buy-In

The easiest, most direct way to make sure you have buy-in from part-time faculty, is to include them as early and as often as possible. **Ownership and investment are the best forms of buy-in.** Faculty who have a sense of ownership and/or investment can also help other part-time faculty to understand the rationale and implications of the innovation.

Find out what hesitations your faculty might have. Typical hesitations include:

- Will it be better for students?
- Will it involve more preparation?
- Fear of failure
- It won't allow for personal style.
- It won't allow time for individual work with students.

Suggestion: Rather than assuming why your faculty might be hesitant . . .

Ask Them! Use formal or informal, electronic or paper, personal or impersonal means - but find out what hesitations they might have. If your faculty tend not to respond to emails try using a paper survey; deliver it personally expressing your sincere desire to know what they are thinking; provide an anonymous means for submission of the survey (a collection envelope in a public space usually works well).

After you ask them, be sure to **honor their hesitations** by addressing them in your training and support program. Remember that these are genuine concerns; simple solutions or dismissal of concerns as trivial will not help develop buy-in. These could be valuable topics to be considered at the outset of an FLC.

Stop now and take some time to think about how you can develop buy-in with your faculty. Record your conclusions on page 23-24.

What do faculty want from professional development?

Faculty perceive professional development opportunities to be "shaped more by the priorities of administration . . . than by the needs of faculty members. . . . Faculty did not believe that the faculty development programs on their campuses were addressing the teaching and learning issues that were most important in their work lives." Daly addresses this concern by noting the value of the FLC "which, by design incorporates high levels of faculty involvement and ownership."[10]

DESIGNING YOUR FLC

Recruiting Participants

This will likely be your most difficult task. It may take time and the enthusiasm of early adopters for the FLC to build to the size you initially hope for. Don't give up. Be persistent.

Colleges with a strong history of FLCs have a competitive application process. This may not be the case at your college. Your faculty may not understand the value of FLCs.

Research has shown that the faculty most likely to be willing to improve their instruction are lifelong learners.[11] This is the best place to start. Look for part-time faculty who are already engaged in professional development. These faculty may become your best recruiters. Encourage them to reach out to their colleagues.

Many part-time faculty will believe that they don't have enough time for an FLC. People spend their time like they spend their money – they are willing to spend it on what they find to be valuable. This means you need to make sure that the work of the FLC is valuable.

To be valuable to faculty, the FLC must connect directly to issues that they are facing in their classrooms.

Be prepared – you may need to start small. But consider this: Are the changes in instruction you hope to implement worthwhile? If so, is it not better that the changes occur in a few classrooms than in none at all?

Who should be invited?

For the purpose of this FLC it is important to limit participation to those who will be implementing the innovation(s). In your invitation to participate, be sure to clarify the purpose of the group and that the group will operate on collective decision making.

Part-time Faculty Only??

The culture at each college is different so this might not be a necessary restriction. However, it is a question worth considering.

In the pilot FLC, feedback from participants indicated it was important to them that only part-time faculty were included.

Feedback from these faculty indicated that:

- They felt more comfortable being open without full-time faculty present.
- They believed if full-time faculty were present, part-time faculty would defer to their input and opinions.
- They wanted to focus on their specific classrooms and practice. In their experience full-time faculty tend to focus on the bigger picture of the whole program.
- If full-time faculty would work collaboratively, honoring part-time faculty perspectives, it might work but participants were hesitant to take the chance.

Should you use incentives?

While incentivizing participation runs the risk of a less invested group of faculty it also may entice those who are hesitant but would be valuable members. Incentives also indicate that the college values the work of the FLC.

Possible incentives:

- Stipends for participation - typically given after completion
- Extra funds for professional development or travel for conferences
- Some institutions award advanced status for faculty who participate in FLCs. This status may come with priority in class selection or a more secure contract.

Take some time now for discussion of these questions. Page 23-24 provides a structure for you and a place to record decisions.

Finding a Good Facilitator

Finding a good facilitator is key to the success of an FLC. As the definition below states, a facilitator's job is to assist, guide, and supervise without taking control or being directive. The intent is that the FLC be self-directed; the facilitator must support this.

A facilitator may solely facilitate or may participate as well. In either case, you are looking for someone who is self-aware, understands the philosophy behind FLCs, and believes in the principles of adult learning. A facilitator needs to be a good community builder and communicator; have a vision for what can happen when faculty learn together; and must be adaptable and patient.

This advice from a facilitator of an FLC at Miami says it well:

> "Stay flexible! Nothing happens as fast you think it will. Be willing to pause, take valuable side trips dictated by the ebb and flow of the group. Don't push too hard, and listen a lot more than you talk. Good things will happen, but it takes time and will not follow the road map drawn on day one. Also, be sure everyone is having fun and enjoying the process. Do fun things. Eat well. Build a culture of trust and mutual respect. Learn from the diversity and creativity of the individuals in the group."[12]

As this indicates, the role of the facilitator can be challenging. Everything you can do to provide adequate support will be crucial to making this job easier. The "Helpful Resources" on page 21 provide a link to an excellent guide for your facilitator.

Brainstorm who might make a good facilitator. See page 23-24.

Institutional Support

At this point you need to start thinking about what support you have for developing this kind of FLC and what support you might need. Having this support in place will be very helpful in sustaining the work of the FLC. You may not know all needs until the FLC has determined its focus and structure, but if you have planned ahead you can be ready with support when it is needed.

It is suggested that you are prepared to provide a stipend for the facilitator as well as a budget for resources. This is not essential as FLCs can be run with no budget but even a minimal budget shows that the institution values the FLC; this can go a long way with faculty in terms of motivation.

Things to consider:

- Will the facilitator receive a stipend?
- Will the FLC have a budget for resources (books, speakers, video series, etc.)?
- Will the FLC have a budget for refreshments?
- Will the stipend/budget come from the department? Your Center for Teaching and Learning? A grant?
- Will participants receive incentives?
    - If a monetary incentive, from what budget will it come?
    - If an award for further professional development, what process will be used to grant the award?

Stop now and develop a tentative budget – or at least budget categories. Determine who will look into questions that arise about the budget.
See page 23-24 for workspace.

Autonomy and a Safe Environment

Much of what is presented in the next sections will be up to the facilitator to implement. However, the design team needs to understand the importance of these elements, as it is likely you will be explaining the FLC to faculty. It is also possible that members of the design team will participate in the FLC and it is important that you understand and support the efforts of the facilitator to build these elements into the FLC.

A key element of an FLC is autonomy. The group must "own" itself and work out a way to reach consensus. Most faculty are used to someone being "in charge" so either take charge or expect someone else to do so. This can be challenging at first but is core to success of the FLC.

- Autonomy allows faculty to see the FLC as a "venue to advance their own personal goals" which increases investment and a sense of ownership.[13]
- Allowing the group to choose its own topics provides opportunity for faculty to learn from one another and increased engagement.[14]
- Autonomy enables the group to establish realistic goals and not overload themselves with work that "becomes 'assignments' rather than opportunities for achieving a deeper understanding of how students learn and how to best facilitate the process."[15]
- As faculty recognize their own abilities and the value of learning from one another they find that "collaborative practices can foster higher levels of student engagement and academic achievement in the classroom."[16]

It is the facilitator's job to help the group determine how to go about making decisions and to guide the group through the process of making those decisions while staying true to the purpose the design team had in mind when establishing the FLC. This is where communication and community building skills are crucial. Drawing out the perspectives of more hesitant FLC members and keeping more dominant members in check can be challenging. The guide referenced in "Helpful Resources" on page 21 can be helpful.

A Safe Environment

The first step in learning is to admit what you don't know, honestly evaluate potential areas of growth, and listen to peer feedback. Being open with other faculty is risky and requires a space that feels safe.

While faculty recognize this need for students, they often fail to recognize the need in themselves. Faculty are used to being seen as experts and often feel compelled to operate from the position of the expert.

Whether faculty are used to the role of "Sage on the Stage" or "Guide on the Side" they are not used to the role of learner. Particularly when with other faculty it is risky to say:

- "I don't know"
- "I don't think I can"
- "What do you think?"
- "That is intimidating"
- "It didn't work"
- "It was a fiasco"

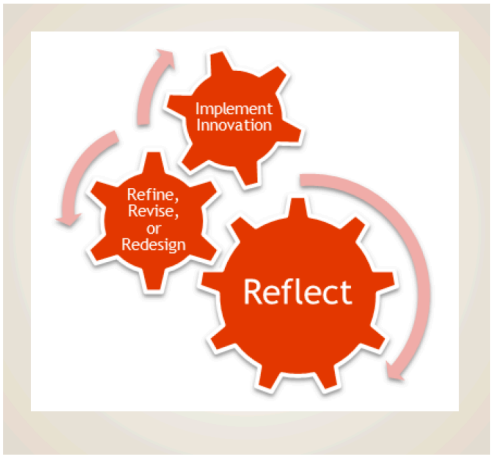
To build a community of learners it is important to build a safe environment. For this to happen, all participants must be willing to sit in both the "learner" seat and the "teacher" seat. While faculty tend to opt for the "teacher" seat, part-time faculty may be used to deferring to full-time faculty and be hesitant to assert themselves, share their perspective and take on the "teacher" seat with other faculty. Everyone's perspective must be valued if all are to feel safe enough to contribute. When establishing the FLC it must be clear that all participants have the responsibility to take both roles, "teacher" and "learner." The "magic" of the FLC is that it draws on everyone's expertise to produce the best of the best.

Learning from one another and learning from mistakes are equally important. Just as students tend to vie away from mistakes, faculty do not often take the time to reflect on and learn from mistakes, yet learning from mistakes can be invaluable. As a group, learning from mistakes can be even more valuable.

Time for Reflection

"We do not learn from experience . . .
We learn from reflecting on experience."
John Dewey

Another key element for FLCs is allowing adequate time and structure for reflection. After trying something new it is important to take time to reflect on its effectiveness. From this reflection one can refine, revise, or redesign in order to improve on the innovation.



Unfortunately, with our emphasis on results we do not always invest enough in the process to achieve the outcome we desire.

Some FLCs build in time and structure for self-refection, others provide opportunities for peer or group feedback followed by an opportunity for self-reflection. Whatever format is used, including reflection is crucial.

Again, it will fall to the facilitator to remind the FLC to include time and structure for reflection in their plan. The design team can make sure the facilitator is aware of the importance of reflection and check in to make sure it is included as the FLC progresses.

Stop now to discuss the importance of autonomy, a safe environment and reflection. Determine who will make sure the facilitator helps the FLC to include these in their plan. You can record this on page 23-24.

Structure and Logistics

The first task of the FLC is to determine its focus and establish its goal or purpose. The facilitator should guide the discussion and may make suggestions based on the work your planning team has done to establish this FLC, but it is important that the FLC determine for itself what it intends to do.

Once the focus has been determined, the group will need to decide how to go about accomplishing its goal or purpose. The structure of the group and the tasks it takes on will vary depending on personalities and the focus of the group

Content

One decision to be made is what content the group will use to guide its work. The list below provides some suggestions that have been used by FLCs but is in no way exhaustive.

- A course outline – If the focus of the FLC is to implement a new course, the FLC may logically follow the course outline and focus on current issues as the course is implemented.
- A lesson study – The Extra Resources section at the end of this guide provides a link to an excellent description of the lesson study approach to professional learning.
- A book – If using a book to provide content and structure make sure that the FLC retains its focus on application. A book club can be a valuable experience but an FLC requires application, reflection, and change in behaviors to accomplish its goals.
- A video series – The pilot FLC that contributed to this guide utilized a video series that is now available through Stanford. A link is provided in the Helpful Resources section on page 21. Other types of videos can be found online. There is often someone in an FLC who is willing to do some research to find something appropriate.

If you have a large group or there are several suggestions for foci, you may want to break into subgroups so that each group can focus on a topic then return to the large group to share their results.

Meeting Time, Place, and Frequency

These logistics would seem simple. However, the nature of part-time work results in complicated schedules. Many part-time faculty work disjointed schedules and need to work multiple jobs, often at multiple institutions.

Finding a meeting time can be challenging. Some options to consider are:

- Establish smaller sub-groups rather than one large group.
- Have varied meeting times to allow for different schedules.
- Include an online component for those who cannot make a scheduled time.

When deciding where to meet, "anecdotal evidence suggests that food and casual meeting space contribute to the trusting environment needed for honest, in-depth discussions about teaching."[17] The pilot FLC previously referenced was held in a comfortable conference room in the Math department. It seemed that this would be convenient so the facilitator did not ask the group about location. However, a participant suggested that perhaps meeting somewhere other than the Math department might feel safer in terms of being overheard by other faculty. The point is that it is important for the FLC to own all aspects of its meetings, even the meeting space.

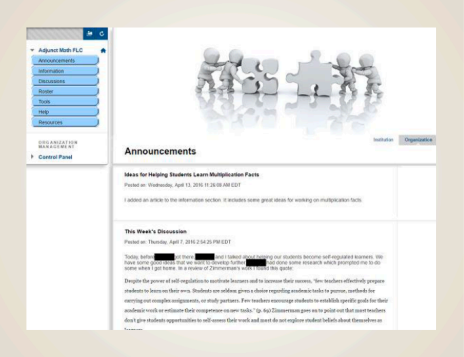
The FLC also needs to determine how often group will meet. Every FLC is different. Some meet 3 times in a semester, providing opportunity to get work done between meetings. Some meet every week to debrief and address current issues. Your FLC will need to determine what will be most effective for their task and realistic for their schedules.

Your design team may want to designate someone to assist the facilitator with obtaining resources and making room reservations, etc. Take time now to discuss these logistics so that you are prepared to support the facilitator. See page 23-24 to record conclusions.

Online component

To accommodate those who were unable to attend FLC meetings, the pilot FLC utilized an online course management system to create an online venue.

A member of the FLC who was well versed with the college's online course management system worked with the IT department to set up a course shell. All members were made administrators so that all had equal access to contribute.



The course was set up with a place for announcements, documents, and discussion board forums.

FLC members found this to be helpful. Several members routinely contributed to the discussion board and added documents to be shared with the group.

Feedback at the end of the FLC included the suggestion that the online component include some sort of notification when things were added to the document section or discussion board. This direct reminder would likely elicit more participation.

Evaluation

As with any program, it is important to include evaluation in the initial design. As each institution has its own evaluation and/or continuous improvement process, this guide will not make recommendations other than to say evaluation should be included in the plan. For continued growth of the FLC you may want to include a report out to the department as part of the evaluation process. Sharing the success of FLCs generally increases interest and participation in future FLCs.

After discussing possible use of an online component and addressing the issue of evaluation record your conclusions on page 23-24.

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13. Daly, "Faculty Learning Communities." 9.

14. Elzinga and Haynes, "Ties that Bind." 84.

15. Ellen Lynch and Margaret Cheatham, "Building a Teaching Commons Among Two-Year and Four-Year Faculty," in *Developing Faculty Learning Communities at Two-Year Colleges,* eds. Susan Sipple and Robin Lightner (Sterling, VA: Stylus Publishing, 2013), 185.

16. Daly, "Faculty Learning Communities." 10.

17. Lynch and Cheatham, "Building a Commons." 180.

HELPFUL RESOURCES

For your facilitator:

An excellent guide: "The Role of the Facilitator in Faculty Learning Communities: Paving the Way for Growth, Productivity, and Collegiality" by Leslie Ortquist-Ahrens and Roben Torosyan in *Learning Communities Journal,* Volume 1, No 1, 2009, pp. 29-62. This article is specific to FLC facilitators in Higher Education and provides a clear description of the work of the facilitator and the process of an FLC.

A pdf. version can be accessed at http://digitalcommons.fairfield.edu/cgi/viewcontent.cgi?article=1002&context=cae-facultypubs

Possible FLC Structures

1. Lesson Study – The lesson study is a tool originally developed in the U.S. that has made a huge impact on math instruction in Japan. An excellent description of this approach is provided in the essay "A Different Approach to Teacher Learning: Lesson Study," by Emily Hanford posted by AmericanRadioWorks.org on August 27, 2015.

   It can be accessed at http://www.americanradioworks.org/segments/a-different-approach-to-teacher-learning-lesson-study/

2. Video Series – One option is "How to Learn Math: For Teachers."

   Information is available at https://www.youcubed.org/category/mooc/

   This series was used by the pilot FLC and is highly recommended. It had been taken offline but is now available as a tuition based PD option.

   Reduces rates are available for groups of faculty.

3. You may want to brainstorm additional resources and list them here.

Cut hear to remove worksheet

WORKSHEET

This worksheet provides space and structure for your team to address the issues raised throughout this guide. This page may be duplicated or removed from the guide for more convenient use. The first column references the page that raised the question(s) or issue(s) to be addressed; the second column provides space to record the conclusions of your discussion.

<table>
<tr><th>Pg.</th><th colspan="2">Question/Issue/Conclusion</th></tr>
<tr><td>7</td><td colspan="2">How to you plan to use a Faculty Learning Community?</td></tr>
<tr><td>8</td><td colspan="2">What are your plans for building faculty “buy-in”?</td></tr>
<tr><td rowspan="2">10</td><td>Would a “part-time only” group be appropriate for your situation?</td><td>Do you intend to use incentives? If so, who will coordinate obtaining and dispersing these incentives?</td></tr>
<tr><td>How and when will recruiting take place?</td><td>How many participants do you hope to recruit? How many is too few?</td></tr>
<tr><td>11</td><td colspan="2">Who might make a good facilitator? (Brainstorm, then discuss and determine who to start with and who should make the connection. You will want to be prepared with answers to Q #12.)</td></tr>
</table>

<table>
<tr><td rowspan="3">12</td><td>Should the facilitator receive a stipend?</td><td>Will the FLC have a budget for resources, refreshments, etc.? How much?</td></tr>
<tr><td>What will the total FLC budget be?</td><td>Where will funds be obtained? Who will follow up with this?</td></tr>
<tr><td colspan="2">Will participants receive incentives? What type? Who will follow up with this?</td></tr>
<tr><td>15</td><td colspan="2">Discuss the importance of autonomy, a safe environment, and reflection. Who will make sure the facilitator helps the FLC to include these in their plan?</td></tr>
<tr><td>18</td><td colspan="2">How might the online component be included? If needed, who will help the FLC with this?</td></tr>
<tr><td>18</td><td colspan="2">What type of evaluation process do you want to establish? Who will follow through with this?</td></tr>
</table>

Chapter 5: Summary, Considerations, and Recommendations

SUMMARY

The guide presented in Chapter 4 was created to assist those who design training and support for part-time math faculty who have been asked to implement innovative instruction in developmental and gateway math courses. The focus for the guide was predicated on the assumption that there is a need for improved instruction in these courses and that many are taught by part-time faculty. As colleges seek to implement best practices, there is a need to train and support part-time faculty to implement the new instructional approaches that are crucial to these best practices.

The guide focuses on framing the training in terms of professional learning and encourages use of a Faculty Learning Community (FLC). After describing professional learning and the FLC model, the guide becomes a workbook that can be used to design a training and/or support program for faculty.

CONSIDERATIONS

The guide focuses on professional learning and the FLC model. It also indicates that if an institution is planning to implement a program that has been developed elsewhere it may be profitable to begin the training with a more typical professional development offering. An orientation or training may be the best way to introduce faculty to a new program. This introduction could be followed by formation of an FLC to support faculty as they implement the new program. If this model is used, it is important that

faculty understand the key elements and perspectives of the new program, those elements that are known to make it effective. The focus of the FLC would then be to make sure they maintain those elements as they implement the program.

While the target audience for this guide is defined as part-time faculty who teach developmental and gateway math courses, it can easily be used for full-time faculty or for faculty in other disciplines. The guide does focus on concerns specific to part-time faculty and some of the content referenced is specific to math. However, these sections could easily be modified, making the guide appropriate for other audiences.

Although it is strongly encouraged that part-time faculty be included on the planning team, the guide was designed for administrators or lead faculty to use when designing such training. While this may be the typical scenario, the guide could also be used by part-time faculty who take the initiative to develop an FLC. The FLC model lends itself to grass roots efforts and could easily be adopted by motivated part-time faculty.

RECOMMENDATIONS

It is hoped this product will promote the notion of using FLCs to support part-time faculty as they implement innovations. Once such use becomes more widespread, it would be helpful to have research that examines the use of FLCs for this purpose. Case studies on use of FLCs for specific purposes would be valuable. Such studies could contribute a better understanding of key dynamics when implementing FLCs. It would be helpful to have research that validates the impact FLCs have on improving instruction with all faculty, and with part-time faculty in particular.

As community colleges fall under further scrutiny and the issue of developmental coursework continues to be of concern, it is likely that classroom instruction will increasingly become a focus for improvement. Hopefully, this dissertation project will contribute to the work by encouraging faculty to risk, reflect, and learn from one another, thereby improving their instruction. It is further hoped that this improvement in instruction will add to initiatives in academic support and result in removing or decreasing the barriers that students face when attempting to obtain a post-secondary education.

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Appendix A: Survey

Supporting Adjunct Math Faculty When Making Changes in Instructional Methods - Survey

General Information:

1. What developmental and/or general education courses do you typically teach?

   Please give content names. (e.g. Basic Math rather than Math 95 and list one in each box.)

Code	Course Title
1	
2	
3	
4	
5	

2. How many courses do you typically teach each term? _____
3. How long have you been teaching at your current institution? _____
4. What was your background before becoming a college instructor?

   _____

Teaching Perspective:

5. Please indicate whether or not you agree with each statement (and to what degree). (Strongly Agree = 5; Strongly Disagree = 0)

5	4	3	2	1	0	
						1. You have a certain amount of intelligence, and you can't really do much to change it.
						2. No matter who you are, you can significantly change your intelligence level.
						3. To be honest, you can't really change how intelligent you are.
						4. You can always substantially change how intelligent you are.
						5. You can learn new things, but you can't really change your basic intelligence.
						6. No matter how much intelligence you have, you can always change it quite a bit.
						7. You can change even your basic intelligence level considerably.
						8. You have a certain amount of talent, and you can't really do much to change it.
						9. No matter who you are, you can significantly change your level of talent.
						10. To be honest, you can't really change how much talent you have.
						11. You can always substantially change how much talent you have.
						12. You can learn new things, but you can't really change your basic level of talent.
						13. No matter how much talent you have, you can always change it quite a bit.
						14. You can change even your basic level of talent considerably.

6. Please read through the following perspectives on teaching and indicate which aligns most closely with your personal perspective by placing a #1 in the blank. (You may list #2 as well.)

_____ **Transmission** - Effective teaching assumes instructors will have mastery over their content. Those who see Transmission as their dominant perspective are committed, sometimes passionately, to their content or subject matter. They believe their content is a relatively well-defined and stable body of knowledge and skills. It is the learners' responsibility to master that content. The instructional process is shaped and guided by the content. It is the teacher's primary responsibility to present the content accurately and efficiently to learners.

_____ **Apprenticeship** - Effective teaching assumes that instructors will be experienced practitioners of what they are teaching. Those who hold Apprenticeship as their dominant perspective are committed to having learners observe them in action, doing what it is that learners must learn. They believe, rather passionately, that teaching and learning are most effective when people are working on authentic tasks in real settings of application or practice. Therefore, the instructional process is often a combination of demonstration, observation and guided practice, with learners gradually doing more and more of the work.

_____ **Developmental** - Effective teaching begins with the learners' prior knowledge of the content and skills to be learned. Instructors holding a Developmental dominant perspective are committed to restructuring how people think about the content. They believe in the emergence of increasingly complex and sophisticated cognitive structures related to thinking about content. The key to changing those structures lies in a combination of effective questioning and 'bridging' knowledge that challenges learners to move from relatively simple to more complex forms of thinking.

_____ **Nurturing** - Effective teaching must respect the learner's self-concept and self-efficacy. Instructors holding Nurturing as their dominant perspective care deeply about their learners, working to support effort as much as achievement. They are committed to the whole person and certainly not just the intellect of the learner. They believe passionately, that anything that threatens the self-concept interferes with learning. Therefore, their teaching always strives for a balance between challenging people to do their best, while supporting and nurturing their efforts to be successful.

_____ **Social Reform** - Effective teaching is the pursuit of social change more than individual learning. Instructors holding Social Reform as their dominant perspective are deeply committed to social issues and structural changes in society. Both content and learners are secondary to large-scale change in society. Instructors are clear and articulate about what changes must take place, and their teaching reflects this clarity of purpose. They have no difficulty justifying the use of their teaching as an instrument of social change. Even when teaching, their professional identity is as an advocate for the changes they wish to bring about in society.

From Pratt, D. D., & Collins, J. B. (2000). The teaching perspectives inventory (TPI). Retrieved from ttp://www.adulterc.org/Proceedings/2000/prattd%26collinsj-final.PDF

7. What do you see as the **top 5 reasons students struggle** in your course(s)?
    1. _____
    2. _____
    3. _____
    4. _____
    5. _____

Course Information:

(For this section please identify which course you are referring to. If you would like to refer to more than one course you will find duplicate copies of questions 8 & 9 on pages 9 & 10 of the survey.)

To which course do the answers to Questions 8 & 9 apply? _____

8. To provide a sense of how much of your course is prescribed please check all of the following that apply.

    - ☐ a. I am given a textbook or web-based learning system that I am to use.
    - ☐ b. I am required to use a common final exam.
    - ☐ c. I am required to use a common mid-term exam.
    - ☐ d. I am required to use common chapter tests.
    - ☐ e. I am given a syllabus to use.
    - ☐ f. I am given a list of specific homework assignments to use.
    - ☐ g. I am given specific projects to require.
    - ☐ h. I am given a calendar of topics to cover.
    - ☐ i. There are additional components I am asked to include in the course (e.g. free writes, study skills). Please list these:

9. On a daily basis **what percent of class time** is spent in each of the following activities?

    a. Lecturing from PowerPoint or at White/Chalk Board

    b. Instruction from an online learning system

    c. Instructor going over homework problems

    d. Student(s) explaining homework problems

    e. Activities designed to practice skills (group activities, time for homework, etc.)

    f. Activities designed for conceptual understanding (explorations, group projects)

    g. Checking for understanding (quizzes or other formative assessment)

Please add notes to expand on or clarify the answers given above:

If your answers to Questions 8 & 9 would be different for another course please skip to Page 9 of the survey for duplicate forms, then return to Page 7 to complete the rest of the survey.

10. What are the top **5 reasons you would hesitate to change** the way you teach?
    1. _____
    2. _____
    3. _____
    4. _____

11. Has your college/department ever **asked you to change the way you teach**?

    (Please Circle) **YES NO**

    a. If you answered **"NO"** please **turn to Question 13 on Page 8.**

    b. If you answered **"YES"** please **briefly explain then check the appropriate boxes below**.

Which of the following strategies did your institution use to train and support you when this change was made and how helpful was each strategy?
Very Helpful = 5; Somewhat helpful = 4; Not very helpful = 3
Did not offer = 2; Would be helpful = 0

5	4	3	2	1	
					They used adjunct faculty input in designing the change.
					I was sent to a training
					They offered a series of in-house trainings.
					They offered a single in-house training session.
					There were periodic follow up trainings.
					They provided one-on-one training.
					I was assigned a mentor.
					They set up a Faculty Learning Community.
					I was given printed explanatory materials.
					I was given printed or online resources.
					I observed an experienced instructor using the method.
					I was observed and given feedback.
					I had opportunity for ongoing discussion of the method.
					I was asked for feedback after change was implemented.
					I received information about results once the change had been implemented.

What other strategies did your department/college use and/or do you wish they had used?

12. If your college/department asked you to change the way you teach **which of the following would be important** to you? Please rank in terms of importance: 1 = most important, 2 = next in importance, etc. 0 = not important to me at all.

_____ a. An explanation of why the change is being made

_____ b. Data supporting positive outcomes of the change at other institutions

_____ c. Data supporting positive outcomes of the change at your own institution

_____ d. Background on how the college/department came to the conclusion this is needed

_____ e. Lots of lead time before the change occurs (how much time? _____)

_____ f. Being provided all materials needed for the change – a total package so I don't need to create a syllabus, homework list, quizzes, tests, etc.

_____ g. Incremental change; allow me to ease into the change

_____ h. A thorough orientation/ initial training

_____ i. An initial orientation followed by several training sessions

_____ j. Demonstrations given by an instructor experienced with the change

_____ k. Observation and feedback of me implementing the change

_____ l. A mentor who I can call on throughout the change process

_____ m. Structured opportunities for in-person discussion during the implementation of the change

_____ n. Structured opportunities for online discussion during the implementation of the change (discussion board or wiki format)

_____ o. Structured opportunities for online discussion during the implementation of the change (via email)

_____ p. Informal opportunities for discussion during the implementation of the change

_____ q. An opportunity to give feedback on how the change is working in my classroom(s)

_____ r. None of these would be important; I see no need to change the way I teach.

Repeat of Questions 8 & 9 for additional courses.

To which course do the following answers to Questions 8 & 9 apply? _____

8. To provide a sense of how much of your course is prescribed please check all of the following that apply.

☐	a.	I am given a textbook or web-based learning system that I am to use.
☐	b.	I am required to use a common final exam.
☐	c.	I am required to use a common mid-term exam.
☐	d.	I am required to use common chapter tests.
☐	e.	I am given a syllabus to use.

	f.	I am given a list of specific homework assignments to use.
	g.	I am given specific projects to require.
	h.	I am given a calendar of topics to cover.
	i.	There are additional components I am asked to include in the course (e.g. free writes, study skills). Please list these:

9. On a daily basis **what percent of class time** is spent in each of the following activities?

   a. Lecturing from PowerPoint or at White/Chalk Board

   b. Instruction from an online learning system

   c. Instructor going over homework problems

   d. Student(s) explaining homework problems

   e. Activities designed to practice skills (group activities, time for homework, etc.)

   f. Activities designed for conceptual understanding (explorations, group projects)

   g. Checking for understanding (quizzes or other formative assessment)

Please add notes to expand on or clarify the answers given above:

Return to Page 7 to complete the survey or continue to next page to answer these questions for more courses.

Appendix B: Survey Consent Form

Consent to be part of a research study - Survey

RESEARCHER INFORMATION

Project Title: Supporting Adjunct Math Faculty When Making Changes in Instructional Methods

Principal Investigator: Barbara Bouthillier

Email: bouthib@ferris.edu Phone: (616)540-3561

Faculty Advisor: Dr. Victor Piercey

Email: VictorPiercey@ferris.edu Phone: (231) 591-2823

STUDY PURPOSE

You are invited to participate in a research study about support systems for adjunct math faculty when implementing changes in instructional methodologies for developmental and general education math courses. Researchers are interested in gaining insight from adjunct math faculty regarding their perceptions of faculty development efforts designed to support implementation of new or revised instructional approaches.

PARTICIPATION

Taking part in this study is completely voluntary.

You are eligible to participate in this study because you are adjunct math faculty in a developmental and/or general education math course. If you agree to be part of this study, you will be asked to complete a survey. The survey will take approximately 30 minutes to complete.

If at any point during the survey you decide not to participate, you may withdraw from the study by simply not completing the survey and/or not submitting the form.

POTENTIAL RISKS/DISCOMFORTS

There are no known risks associated with this study.

ANTICIPATED BENEFITS

Although this research is not designed to help you personally, it will afford you the opportunity to reflect on your own instruction as well as what support strategies might be helpful should you choose or be requested to make changes in your approach to instruction. This reflection may have a positive impact on your instruction and therefore your students' success. The results of the study will be shared with a representative of your institution; this may provide additional insights to enhance the professional development opportunities at your institution.

CONFIDENTIALITY

Signing this form is required in order for you to take part in the study and gives the researchers your permission to obtain, use and share information about you for this study. The results of this study could be published in an article, but would not include any information that would identify you. There are some reasons why people other than the researchers may need to see the information you provided as part of the study. This includes organizations responsible for making sure the research is conducted safely and properly, including Ferris State University.

After submission, a code will be placed on this consent form and your survey. Using this code, the researcher will be able to link your survey to your identity. Only the researcher will have access to the identification key.

In order to keep your information safe, the researchers will protect your anonymity and maintain your confidentiality. The data you provide will be stored in a locked file. The identification key will be securely stored separately. The researchers will retain the data for 3 years after which time the researchers will dispose of your data by standard state of the art methods for secure disposal. The data will not be made available to other researchers for other studies following the completion of this research study.

CONTACT INFORMATION

The main researcher conducting this study is Barbara Bouthillier a doctoral student at Ferris State University. If you have any questions you may email her at bouthib@ferris.edu or call (616) 540-3561.

If you have any questions or concerns about your rights as a subject in this study, please contact:

Ferris State University Institutional Review Board (IRB) for Human Participants, 220 Ferris Drive, PHR 308, Big Rapids, MI 49307, (231) 591-2553, IRB@ferris.edu.

SIGNATURES

Research Subject: I understand the information printed on this form. I understand that if I have more questions or concerns about the study or my participation as a research subject, I may contact the people listed above in the "Contact Information" section. I understand that I may make a copy of this form. I understand that if my ability to consent for myself changes, either I or my legal representative may be asked to re-consent prior to my continued participation.

Signature of Subject: _____ Date of Signature:_____

Printed Name: _____

Contact Information: email - _____ phone - _____

Principal Investigator (or Designee): I have given this research subject (or his/her legally authorized representative, if applicable) information about this study that I believe is accurate and complete. The subject has indicated that he or she understands the nature of the study and the risks and benefits of participating.

Printed Name:_____Title:_____

Signature:_____ Date of Signature:_____

Appendix C: Invitation to Participate in FLC

Sample email invitation to adjunct developmental math faculty at GRCC:

As some of you know, I am working on a Doctorate in Community College Leadership at Ferris State University. As part of my dissertation work I am putting together a Faculty Learning Community for adjunct faculty who teach MA 95, 96, 97. Briefly stated, an FLC is a group of faculty who decide to work together to address an issue. Rather than simply meet and discuss a topic and learn about something, the focus of FLCs is on application.

This group would determine an issue to focus on and then work together to come up with a plan to address it. Typically, this means that the FLC reads and discusses articles, brings in speakers, or shares with one another from their own experience. Part of the process is to create action steps and then support one another in implementation. Simply put, two minds (or 5 or 7 or 10) are better than one.

Rather than working in isolation, an FLC provides opportunity for encouragement and the energy that comes from collaboration. Studies have shown that faculty in FLCs perceive improvement in their instruction, see a positive impact on student success, and gain deeper sense of community.

The FLC will meet winter semester of 2016. Meeting times and frequency will be determined by the group, as will the topic to be addressed. My role will be to facilitate the group. I will take care of logistics and bring in whatever resources the group determines are needed. I will also be observing and eventually reporting on the group's work in the form of a case study.

If you are interested and/or would like to hear more about how this will work please let me know. Once I determine who is interested I will schedule an informational meeting. Hopefully, this will occur before the first week of classes. At that point, those who decide to commit will set an initial meeting time. You can simply reply to this email, call or text at (616)540-3561 or catch me in the hall.

My hope is that this will help us address some of the frustrations we face in teaching some of our most challenging students.

Barb

Appendix D: FLC Consent Form

Project Title: Supporting Adjunct Faculty in Improving Developmental Math Instruction: A Case Study

Principal Investigator: Barbara Bouthillier

Email: bouthib@ferris.edu Phone: (616)540-3561

Faculty Advisor: Dr. Victor Piercey

Email: VictorPiercey@ferris.edu Phone: (231) 591-2823

STUDY PURPOSE

You are invited to participate in Faculty Learning Community (FLC) which will be used as a case study to explore the use of FLCs to support adjunct faculty in improving developmental math instruction.

PARTICIPATION

Taking part in this study is completely voluntary.

You are eligible to participate in this study because you are adjunct math faculty in a developmental math course. If you agree to participate you will be part of a one semester adjunct developmental math Faculty Learning Community. The FLC will determine an aspect of instruction in MA 95, 96, 97 that they would like to improve. The process the group uses, the scheduling of meetings, determination of activities, and methods of assessment will be mutually agreed upon by the group. The researcher/facilitator will provide guidance and support but the group will be autonomous.

As this is a case study, by consenting to participate, you are granting permission to the researcher to document and report the process the group uses, the issue addressed, and the outcome. You are also granting permission for the researcher to collect, report, and share any of the materials developed and data regarding outcomes and to provide the researcher with a personal reflection of the experience at the conclusion of the semester.

If at any point during the semester you decide to cease participation in the FLC you have the right to withdraw from the group. Choosing to participate in this study or not participate in no way impacts your employment at Grand Rapids Community College.

POTENTIAL RISKS/DISCOMFORTS

There are no known risks associated with this study.

ANTICIPATED BENEFITS

Research indicates that participation in a FLC often increases adjunct faculty's sense of belonging and has a positive impact on instructional practices and student success. The case study will provide a model for continued use of FLCs to assist faculty as they seek to improve instruction.

CONFIDENTIALITY

Signing this form is required in order for you to take part in the study and gives the researchers your permission to observe and report on the process, products, and outcomes of the FLC. The results of this study could be published in an article, but would not include any information that would identify you. There are some reasons why people other than the researchers may need to

see the information you provided as part of the study. This includes organizations responsible for making sure the research is conducted safely and properly, including Ferris State University.

This consent form will be stored in a locked cabinet for a period of three years. There will be no connections made between identities on these forms and specific contributions made to the FLC. No observations recorded or reported will include identities of those participating in the study. Any identification on materials collected will be removed prior to inclusion in the artifact collection.

CONTACT INFORMATION

The main researcher conducting this study is Barbara Bouthillier a doctoral student at Ferris State University. If you have any questions you may email her at bouthib@ferris.edu or call (616) 540-3561.

If you have any questions or concerns about your rights as a subject in this study, please contact: Ferris State University Institutional Review Board (IRB) for Human Participants, 220 Ferris Drive, PHR 308, Big Rapids, MI 49307, (231) 591-2553, IRB@ferris.edu.

SIGNATURES

Research Subject: I understand the information printed on this form. I understand that if I have more questions or concerns about the study or my participation as a research subject, I may contact the people listed above in the "Contact Information" section. I understand that I may make a copy of this form. I understand that if my ability to consent for myself changes, either I or my legal representative may be asked to re-consent prior to my continued participation.

Signature of Subject: _____ Date of Signature:_____

Printed Name: _____

Contact Information: email - _____ phone - _____

Principal Investigator (or Designee): I have given this research subject (or his/her legally authorized representative, if applicable) information about this study that I believe is accurate and complete. The subject has indicated that he or she understands the nature of the study and the risks and benefits of participating.

Printed Name:_____Title:_____

Signature:_____ Date of Signature:_____

Appendix E: IRB Approval Letter

FERRIS STATE UNIVERSITY

Institutional Review Board for Human Subjects in Research

Office of Academic Research, 220 Ferris Drive, PHR 308 · Big Rapids, MI 49307

Date: December 14, 2015

To: Dr. Victor Piercey and Ms. Barbara Bouthillier
From: Dr. Gregory Wellman, IRB Chair
Re: IRB Application #151110 *(Supporting Adjunct Faculty in Improving Developmental Math Instruction: A Case Study)*

The Ferris State University Institutional Review Board (IRB) has reviewed your application for using human subjects in the study, "*Supporting Adjunct Faculty in Improving Developmental Math Instruction: A Case Study"* (#151110) and determined that it meets Federal Regulations *Expedited-category 2F.* This approval has an expiration of one year from the date of this letter. **As such, you may collect data according to the procedures outlined in your application until December 14, 2016**. Should additional time be needed to conduct your approved study, a request for extension must be submitted to the IRB a month prior to its expiration.

Your protocol has been assigned project number (#151110), which you should refer to in future correspondence involving this same research procedure. Approval mandates that you follow all University policy and procedures, in addition to applicable governmental regulations. Approval applies only to the activities described in the protocol submission; should revisions need to be made, all materials must be approved by the IRB prior to initiation. In addition, the IRB must be made aware of any serious and unexpected and/or unanticipated adverse events as well as complaints and non-compliance issues.

Understand that informed consent is a process beginning with a description of the study and participant rights with assurance of participant understanding, followed by a signed consent form. Informed consent must continue throughout the study via a dialogue between the researcher and research participant. Federal regulations require each participant receive a copy of the signed consent document and investigators maintain consent records for a minimum of three years.

As mandated by Title 45 Code of Federal Regulations, Part 46 (45 CFR 46) the IRB requires submission of annual reviews during the life of the research project and a Final Report Form upon study completion. Thank you for your compliance with these guidelines and best wishes for a successful research endeavor. Please let us know if the IRB can be of any future assistance.

Regards,

Ferris State University Institutional Review Board
Office of Academic Research, Academic Affairs

Version 1.2015