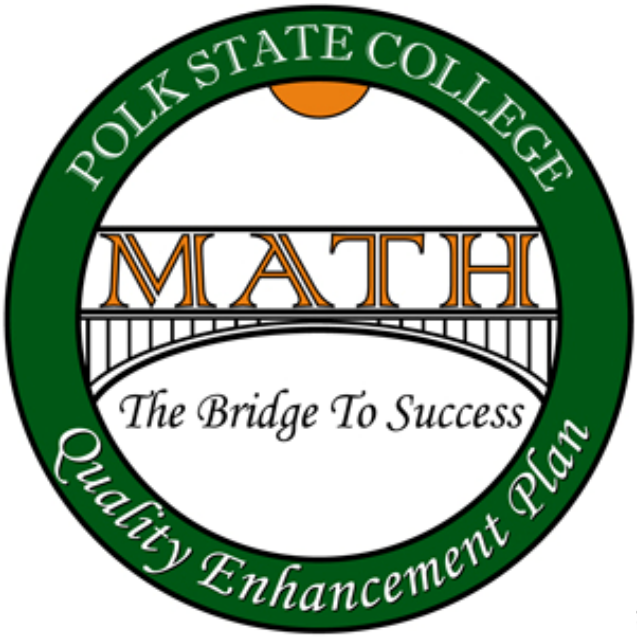

Math: The Bridge to Success

A Quality Enhancement Plan

for

POLK STATE COLLEGE

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On-site Review: October 5-7, 2010

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Chapter 1: Executive Summary

Polk State College's Quality Enhancement Plan (QEP), Math: The Bridge to Success, reflects an institution-wide process that aims to improve student learning in Intermediate Algebra (MAT 1033) and the learning environment for MAT 1033 students. In the development, the QEP Committee, consisting of students, faculty, deans, and many other college functions, reviewed input from the college community and key issues that emerged from institutional assessment to determine the area most in need of improvement.

Signifying an area of high impact on how the College accomplishes its mission was a 2008 report from the Florida Department of Education, wherein Polk State College students ranked last (41%) among the 28 community/state colleges in successful completion of Intermediate Algebra (MAT 1033). Because only 15% of the students place above MAT 1033, the statistics were alarming given that the course is a prerequisite to all college-level math courses required for the associate in arts (AA) degree and associate in science (AS) degrees.

Further research and data analysis was supported by the *Community College Survey of Student Engagement*, which stated in 2008: "Student learning and student retention are correlated strongly with student engagement." Therefore, this QEP endorses a college-wide transformation in *how* mathematics is taught rather than *what* is taught while maintaining the focus on four main outcomes: Students will demonstrate competence in MAT 1033 learning outcomes, they will successfully complete MAT 1033 on the first attempt, they will be successful in the subsequent math courses, and they will graduate in their selected degree programs.

Recent research in best practices, such as Blumberg's (2009) rubrics, will be utilized to enable faculty to transition toward the first goal of the plan: more learner-centered teaching. The rubrics, based on Weimer's (2002) five dimensions of learner-centered teaching: *Function of Content*, *Role of the Instructor*, *The Responsibility for Learning*, *The Purposes and Processes of Assessment,* and *The Balance of Power* will be pilot-tested with two MAT 1033 sections during fall 2010. The actual rollout begins in spring 2011 and will increase until at least 75% of MAT 1033 sections are infused with learner-centered practices. Dr. Blumberg will initially train all faculty involved and return each summer to provide training for new faculty and more comprehensive training for current faculty. In addition, faculty will attend various professional conferences.

The second goal of the plan will institute a more supportive learning environment. In addition to changing the environment in the classroom, this goal involves many areas of the College, including tutoring centers, student services, and libraries. Demonstrating the college's capability to initiate, implement, and complete the QEP, its resource requirements are supported with recurring funds for professional development, decreased class sizes, marketing, and other activities outlined in the proposal. These resources will be available for the duration of the QEP and are designed to become part of operational resources for increased student learning.

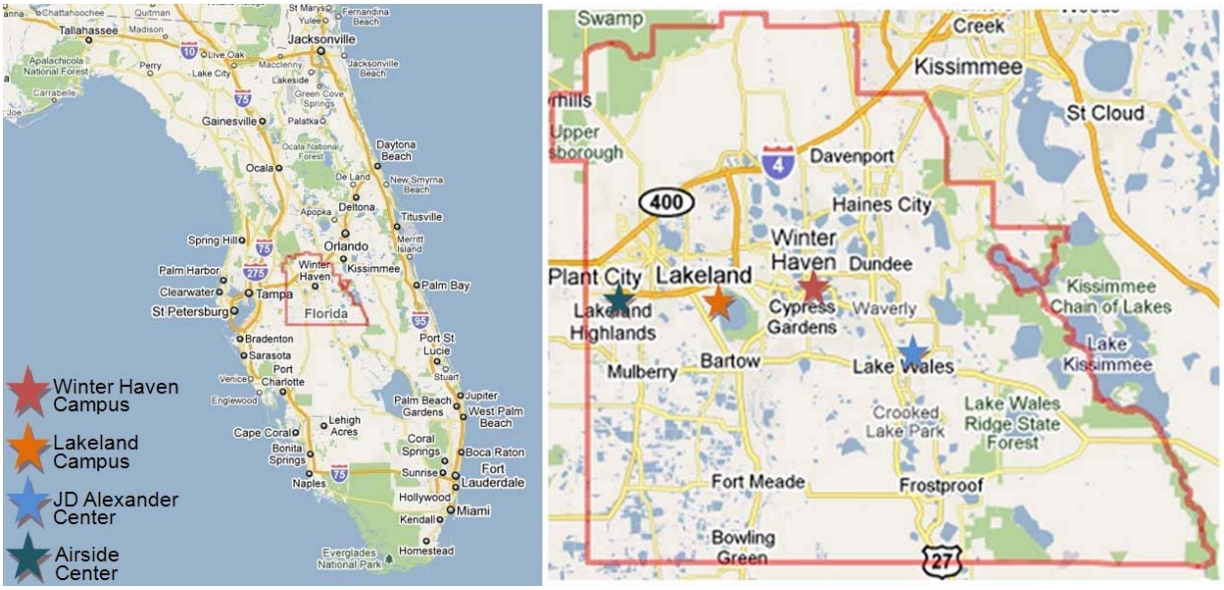
The assessment design is fully integrated with the college's Educational Program Assessment (EPA) model and the assessment and accountability targets defined by the Key Performance Indicator (KPI) metrics of the college's strategic plan. Evaluation activities include summative assessment of student learning outcomes in MAT 1033, longitudinal comparative student performance measures, student perceptions of instruction and educational support, self-evaluations of faculty across learner-centered dimensions of instruction, and many auxiliary measures. Results will be correlated and reported annually to continuously improve the QEP.

Chapter 2: Process Used to Develop the QEP

Overview of Polk State College

Located in Central Florida, Polk State College was founded in 1964 to serve the higher education needs of Polk County, the fourth largest and ninth most populous of the state's 67 counties. Over the years, Polk State College has undergone tremendous growth and change. The first academic year (1964) started with 1,107 students in temporary quarters on the Bartow Air Base. Today, under the leadership of the President, Dr. Eileen Holden, the College annually serves nearly 14,000 credit and 8,000 non-credit students in locations throughout Polk County (see Figure 2-1). By the end of academic year 2009/2010, the total enrollment exceeded 6,700 FTE (full-time equivalent).

Figure 2-1: Polk State College's Locations in Polk County, Florida



As part of Florida College System of 28 state and community colleges, Polk State College was selected as one of nine institutions to participate in the Florida State College Pilot Project, which was initiated by the Florida Legislature to enable community colleges to offer specialized workforce-oriented baccalaureate degrees that meet local needs. Subsequently, the College changed its name from Polk Community College to Polk State College (July 2009) and modified its mission to reflect the change:

> Mission: Polk State College is a quality-driven educational institution, providing access to affordable associate and baccalaureate degrees, career certificates, and workforce development programs, delivered by diverse, qualified faculty and staff who are committed to student learning and achievement through the consistent practice of collaboration and focus on excellence.

The college's goal is to assure that every student can acquire the knowledge, skills, abilities, and attitudes necessary for success in advanced education, a chosen career, and participation in a diverse and changing society. With its expanded mission, Polk State College continues to be an open-access community college with programs and services that reflect the diversity of its

students and the dynamic needs of its community. The College regularly collaborates with members of the community to ensure that educational programs grow with the needs of a changing society and global market. Approximately 72% of Polk State College's credit students are part time, 63% are female, and over 32% are racial/ethnic minorities.

The College is a multi-campus institution with one campus in Winter Haven and one in Lakeland. Two additional centers provide selected program offerings to local communities: the JD Alexander Center in Lake Wales and the Airside Center southwest of Lakeland. An estimated 70% of Polk State College's graduates receive the Associate in Arts (AA) degree. The AA courses parallel equivalent courses offered in the Florida State University System, and the AA degree credits are transferable to all universities in the Florida State University System. Polk State College currently offers one Associate in Arts degree with 77 different advising tracks; these advising tracks allow students to prepare for their respective majors before entering a college or university.

Additionally, Polk State College offers 30 Associate in Science (AS), 27 Associate in Applied Science (AAS) degrees, and one Bachelor of Applied Science (BAS) degree with three areas of concentration. Approximately 60% of Polk County nurses have been educated through Polk State College's nursing program. Furthermore, the College offers 22 certificate programs, two applied technical diplomas, and several continuing education classes. An estimated 90% of city and county law enforcement officers in Polk County have been trained at Polk State College. Since opening in 1964, Polk State College has awarded over 32,000 degrees.

Process Used to Identify the Topic

The process used to identify the topic for Polk State College's Quality Enhancement Plan (QEP) consisted of varied activities intentionally targeting the different constituent groups of the College. The approach occurred in three phases over a one-and-a-half-year time span.

Phase One – Information and Clarification of the QEP Process

The first phase consisted of familiarizing Polk State College constituents with the definition of and rationale for the QEP. As part of an overall discussion of the Southern Association of Colleges and Schools (SACS) reaffirmation process, the initial institutional introduction to the QEP occurred at a faculty meeting immediately following the fall convocation of August 2007. The District Dean of Academic and Student Services and the Director of Institutional Research, Effectiveness, and Planning facilitated a discussion of Polk State College's general education outcomes with faculty and also introduced the concept of a QEP.

With the college's transition to a new Vice President for Academic and Student Services, the exploration and provision of information about the QEP continued at a faculty meeting in August 2008, providing a more in-depth explanation of the necessity to identify a focus for the QEP. Faculty concentrated on student learning issues that need to be addressed at Polk State College, and their input was gathered. To ensure that all college constituents had an opportunity to engage in the initial dialogue regarding student learning issues and improving student learning outcomes at Polk State College, the Vice President continued to facilitate QEP discussions in all academic and non-academic departments and groups throughout the fall term of 2008. The responses were then categorized into the following classifications: (1) study skills/college success, (2) technology, (3) resources, (4) college preparatory courses, (5)

learning communities, (6) new programs, (7) professional development, (8) general education, (9) retention/attrition, and (10) learning environment. A summary of responses is included in Appendix A.

Additionally, the results of the 2007 *Community College Survey of Student Engagement* (CCSSE), a survey of student perceptions, were disseminated to the academic community to further assist in the identification of the QEP's focus.

To promote further dialogue and to assess faculty and staff's perceptions of areas of concern regarding student learning to further explore in the QEP, an institutional survey was administered. Six questions/comments were posed: (1) What is the general college area you are working in?; (2) What is the general area of student success you are most concerned about?; (3) Please explain why you think the area you just selected is so important; (4) Considering your input above, please try to think about a more specific topic/issue that needs to be addressed to produce improvements in this area at Polk Community College (now Polk State College); (5) What do you think needs to be done in order to address this topic/issue successfully; and (6) Who do you think needs to be involved in the process and why? A survey summary is presented in Appendix B, while its results and other data collected during this phase are discussed in Chapter 3 of this plan.

In October 2008, as a part of the District Board of Trustees (DBOT) Annual Strategic Planning Retreat, the members were briefed with the rationale for the QEP. Additionally, the preliminary quantitative and qualitative data that had been gathered and reviewed, the timeline for developing the proposal, and the DBOT's role in the overall process were also discussed. At the conclusion of the presentation, DBOT members were afforded the opportunity to ask questions in order to clarify their comprehension of and engagement in the overall process of the QEP development.

Phase Two – Formation of the QEP Committee

In November of 2008, at the preliminary closing of the information and clarification phase (Phase 1), individuals from across the College were invited to participate in the QEP Steering Committee, which later became the QEP Committee. Over the next few months, the membership was broadened to ensure cross-disciplinary and interdepartmental representation. Table 2-1 on the following page provides a list of the individuals selected to comprise the QEP Committee.

Phase Three – Identifying the topic

To better define the functioning of the QEP Committee, the first meeting focused on an overview of the QEP process as well as the roles and responsibilities of the Committee. Additionally, the QEP Committee reviewed the data that were collected during Phase 1 and discussed the findings. Several themes emerged from the review of the data:

a) Polk State College students demonstrate one of the lowest pass rates in mathematics (specifically MAT 1033) when compared to students of the other 28 state colleges.

b) Polk State College students that placed into college preparatory math had a 6-year college completion rate of less than 15% compared to the 45% completion rate of college-ready students.

Table 2-1: QEP Committee Members and Functions

QEP Committee - Responsible for QEP Development, Planning, and Implementation		
Committee Member	Title	Role
Kaye Betz	Mathematics Professor, Department Coordinator, Lakeland	Co-chair, QEP Committee
Dr. Kenneth Ross	Vice President for Academic and Student Services	Co-chair, QEP Committee
Peter Usinger	Director of Inst. Research, Effectiveness, and Planning	SACS Liaison / Assessment Team Leader
Hertencia Bowe	Program Director for Health Information Management	Travel Team / Focus Group Team / Implementation Team
Anna Butler	Mathematics Professor	Literature Review Team / Implementation Team
Brittany Dickens	Student, Student Government Association	Implementation Team
Bill Foege	Director of Teaching/Learning Computing Center and Learning Resources, Lakeland	Literature Review Team
Steve Frye	Mathematics Professor	Data Review Team / Implementation Team
Robert Gerber	Student, Phi Theta Kappa	Implementation Team
Maryanne Hyacinthe	Student, Student Government Association	Implementation Team
Wayne Kline	Supply Chain Coordinator	Marketing Team
Debra Laraway	Mathematics Professor	Literature Review Team / Implementation Team
Richard Leedy	Mathematics Professor	Literature Review Team / Implementation Team
Charlie Lyle	Dean of Student Services, Winter Haven	Marketing Team Co-leader / Focus Group Team/Implementation Team
Gregory Marshall	Director of TRiO Student Support Services	Implementation Team
Sandy May	Senior Administrative Assistant	Focus Group Team
Penny Morris	Mathematics Professor	Data Review Team / Implementation Team
Dr. Marvin Pippert	Dean of Academic Affairs, Lakeland	Implementation Team Leader / Travel Team / Focus Group Team
Paul Pletcher	Mathematics Professor, Dept. Coordinator, Winter Haven	Data Review Team / Implementation Team
Saul Reyes	Manager of JD Alexander Center	Literature Review Team / Marketing Team
Sheila Rios	Program Director for Office Administration / Medical Administration / Medical Transcription	Focus Group Team Leader / Implementation Team
Trish Shuart	Dean of Academic Affairs, Winter Haven	Data Review Team Leader / Implementation Team
Sherry Siler	English Professor, Dept. Coordinator, Winter Haven	Literature Review Team Co-leader
Courtlann Thomas	District Director of Academic Support Services	Travel Team Leader / Marketing Team / Implementation Team
George Urbano	District Director of Facilities	Budget Team Leader / Marketing Team
Reggie Webb	Dean of Student Services, Lakeland	Marketing Team Co-leader / Implementation Team
Dr. Lynda Wolverton	Reading Professor, Dept. Coordinator, Lakeland	Literature Review Team Co-leader

The Committee also investigated the possibility of focusing the QEP on college preparatory courses. However, because Polk State College had recently begun student success initiatives in college preparatory classes for First-Time-in-College (FTIC) students, the Committee decided that it will be worthwhile to focus the QEP on mathematics rather than college preparatory courses.

State success rate data and various program curricula for AA and AS programs were reviewed to determine the level of mathematics on which to focus the QEP. Intermediate Algebra (MAT 1033) began to emerge as the course most in need of concerted improvement. The committee members revisited additional supporting data, such as pass and withdrawal rate comparisons and course-specific student retention data to validate the potential selection of MAT 1033 as the QEP focus.

In February 2009, the QEP Committee sought a more comprehensive overview of the QEP process and revisited the qualitative and quantitative data for mathematics courses. This data review enabled the Committee to confirm that MAT 1033 should indeed be the focus of the QEP. Quality enhancement of MAT 1033 would garner more expansive outcomes because all students seeking an AA or AS degree are required to take MAT 1033 or test out of it, and fewer than 15% of students test out of MAT 1033. Thus, at Polk State College, MAT 1033 often stands as a gatekeeper course impeding the academic progress of students.

Other concerns that the QEP Committee considered in the selection of MAT 1033 include:

a) Stability during the QEP implementation: MAT 1033 is predominantly taught by full-time faculty, which adds stability to the implementation.

b) Spreading resources and diluting effectiveness: the Committee decided not to include MAT 0024 in order to concentrate efforts and available resources on the gatekeeper course.

The QEP Committee also recognized that QEP ownership by the mathematics faculty was imperative in the success of the QEP. During a college-wide mathematics faculty meeting, a cohort of mathematics faculty was added to the QEP Committee to maintain communication between the two groups, to promote collaboration, and to ensure a partnership of the Mathematics Department and the QEP Committee throughout the development and implementation of the QEP.

Process Used to Develop the Topic

Once the topic was identified, the QEP Committee delegated teams to efficiently accomplish necessary tasks. The Mathematics Department and the QEP Committee collaborated throughout the process, including participation in professional development activities to gather current strategies used to address learning issues in mathematics.

Developing QEP Outcomes

With the support of the Mathematics Department, the Committee began identifying expected outcomes. The outcomes revolved around what Polk State College faculty wanted students to be able to accomplish as a result of the implementation of the QEP. The Committee agreed that increased student learning in Intermediate Algebra (MAT 1033) was a desired

result. In addition, students should acquire enough understanding and skills to be successful in the subsequent mathematics course. Four QEP outcomes evolved:

- QEP Outcome #1: Students will demonstrate all five student learning outcomes under Goal 1, Objective 1.1.
- QEP Outcome #2: Students who take Intermediate Algebra will successfully complete it on the first attempt.
- QEP Outcome #3: Students who successfully complete Intermediate Algebra will be successful in the subsequent mathematics course.
- QEP Outcome #4: Students completing Intermediate Algebra will graduate in their selected degree programs.

Goals and student learning outcomes are discussed in detail in Chapter 4.

QEP Committee Teamwork

The following teams collaborated during the QEP development process: (1) Focus Group, (2) Literature Review, (3) Travel, (4) Data Review, (5) Marketing, (6) Mathematics Faculty, (7) Implementation, (8) Assessment, and (9) Budget. As the committee evolved, additional faculty, staff, students, and administrators were included for their expertise and assistance in various team areas.

Focus Group Team

The QEP Committee decided to increase student input in guiding the development and implementation phases of the QEP. Thus, student focus groups and student surveys were conducted. The Focus Group Team conducted focus-group sessions with students and mathematics tutors. Qualitative data were derived from students who participated in the student focus groups (May 2009). Student surveys as well as mathematics faculty surveys were also conducted. The results of the focus-group sessions and surveys are presented in Chapter 3.

Literature Review Team

In April 2009, the Literature Review Team began searching the literature using key terms, such as *best practices*, *post-secondary*, *mathematics*, *education*, *learning*, and *developmental*. They also searched for articles on topic areas suggested by the Mathematics Department and QEP Committee, such as active learning, student engagement, problem-based learning, learning-centered teaching, learning communities, assessment, professionalism, supplemental instruction, study skills, and learning styles. Additionally, they researched a list of national organizations, such as the American Mathematical Association of Two-Year Colleges (AMATYC), the League for Innovation in the Community College, the Community College Survey of Student Engagement (CCSSE), and the Mathematical Association of America (MAA).

Table 2-2 presents a list of math-specific and general instructional themes gleaned from the literature review and then shared with the QEP Committee and the Mathematics Department. From this list, the mathematics faculty selected the items they believed were most applicable to students, faculty, and the mathematics curriculum at Polk State College. Unselected items were discussed further, with evidence and/or references disseminated so that faculty could undertake additional research.

Table 2-2: Themes from the Literature Review

High expectations combined with high levels of support can positively impact learning.
Both instructors and students should utilize appropriate technology.
A supportive classroom environment needs to be created.
The syllabus is an important tool in setting the tone for the class.
The learning experience must be meaningful to the students.
Students will work harder and longer if a purposeful rationale is given for learning the topic.
Students will be more involved if they understand the utility of the material.
New material needs to be connected to current knowledge if possible.
The connection with the teacher and other students furthers student engagement in class.
Active learning increases student engagement.
Memorizing is not the same as learning because memorized material is quickly forgotten.
Reflection is an important part of the learning process.
Motivated students put forth more effort than those who are not motivated.
Covering material is not the same as actively attempting to teach it.
Engaged students make better learners, and engaged instructors make better teachers.
Mathematics is a more challenging subject because many students already have a negative attitude.
Positive effect on learning: Learning communities, collaborative learning, problem-based learning, and constructivism.
Mastery learning has a positive impact on students' long-term memory involving skill-based problems.
Learning styles and study skills are important to keep in mind when trying to improve learning.
Education needs to be learner-centered.
Instructors should stay current on teaching methods/trends in math through professional development.
Academic and student services should work together to provide support for students' success.

Travel Team

The Travel Team searched for colleges that had recently completed mathematics-related QEPs, resulting in a five-person travel team visiting Tallahassee Community College (TCC) in Tallahassee, Florida, to gather information about developing a QEP. The travel team learned about the redesign of three of TCC's mathematics courses and shared this information with the QEP Committee and the Mathematics Department. In addition, the QEP chair from Northwest Mississippi Community College came to Polk State College to share her college's experiences with both the QEP Committee and the Mathematics Department.

Data Review Team

The team began a more thorough review of the data sets collected during Phase 1 and recommended the collection of additional data sets as questions arose. The following data sets were reviewed: (1) Institutional QEP Survey, (2) Mathematics Faculty Survey, (3) Student Math Survey, (4) MAT 1033 student focus groups, (5) mathematics tutor focus group, (6) Community College Survey of Student Engagement (CCSSE) Report, (7) Student Perception of Instruction Survey, (8) end-of-the-semester examination results for MAT 1033, (9) Florida Department of Education First-Time-in-College (FTIC) student achievement rates in college readiness courses, (10) student success rates in MAT 1033, (11) FTIC enrollment and mathematics readiness, and (12) retention rates of students enrolled in MAT 0012, MAT 0024, and MAT 1033. A list of data points, shown in Table 2-3, was shared with the QEP Committee and the Mathematics Department.

Table 2-3: Data points

Polk State College repeatedly ranked lowest in MAT 1033 pass rate (41%) in the Florida College System.
Local developmental math needs are traditionally among the highest in the state (71.3%).
Fall-to-Spring First-Time-in-College student (FTIC) retention rate for MAT 1033 completers is >55%; for those failing MAT 1033, it is <24%.
Math *College Prep* students' 6-year degree completion rate on average is 13.8%, compared to 46.9% for *College Ready* students.
Strong local variances in MAT 1033 student pass rates were found among full-time faculty (27%-69%) across almost identical student cohorts (in CPT scores and final exam performance).
Focus group commentary by students indicates that a more engaged and personable instructor was helping them to be more successful.
Students learning from instructors who have students with higher pass rates perform equally or better in subsequent math and science classes.
Average pass-rate differences between students of adjunct and full-time faculty are marginal.
No significant differences were found between classes using computer lab or not using it.
Evidence about impact of supplemental instruction was inconclusive.

The QEP Committee determined it to be essential that discussions in the entire Mathematics Department be guided by research, data, and best practices. Furthermore, as new, relevant research and data findings were agreed upon, this information was also presented to all mathematics faculty.

Marketing Team

The Marketing Team worked with faculty, students, and staff to develop a plan for promoting the QEP. The major planning benchmark for the team was the August 2010 institution-wide rollout of the QEP. Prior to the August 2010 rollout, the following promotional activities were conducted:

a) A list of possible titles for the QEP project was gathered from various sources. Students, employees, and alumni were surveyed to determine an appropriate title for the QEP from five possible titles. The survey results, shown in Table 2-4, revealed that the majority's choice for the QEP title was *Math: The Bridge to Success*.

Table 2-4: QEP Title Survey Results

All people surveyed		**Students only**	
Title	N of People	Title	N of People
Math: The Bridge to Success	100 (27%)	Math: The Universal Language	51 (26%)
Math PLUS	85 (23%)	Math: The Bridge to Success	50 (25%)
Math: The Universal Language	82 (22%)	Math PLUS	47 (24%)
Powered by Math	54	Powered by Math	28
M+M: Meaningful Math	20	M+M: Meaningful Math	11
Various Other Titles	25	Various Other Titles	10

b) Student participation in branding the QEP was also sought. In the spring of 2010, all current Polk State College students were invited to participate in a logo design contest to create a graphic depiction of the QEP title, *Math: The Bridge to Success*. The design contest was advertised through the Polk State College website, Facebook, and informational handouts, and instructors announced the competition in their classes. The contest culminated with a vivid, winning work of art that visually illustrates the QEP title.

The team also used effective communication as a promotional tool. College-wide presentations were conducted, discussing the status of the QEP, gathering additional input and feedback, and promoting the benefits of the QEP. Two QEP-related articles were published in *PRIDE*, the college's employee newsletter (see Appendix C). Other marketing strategies used to inform stakeholders of the QEP's progress and status and to promote the project were as follows:

- The College President's regular update to the District Board of Trustees
- Creation of a brochure
- Creation of a QEP song
- Creation of a QEP Frequently Asked Questions (FAQ) web page
- Installation of a QEP screensaver on all public computers

Mathematics Faculty Team

Upon identification of the QEP topic, the college-wide Mathematics Department met to learn about the QEP. Blair's (2006) *Beyond Crossroads: Implementing Mathematics Standards in the First Two Years of College* was provided to faculty and the QEP Committee members to familiarize them with best practices in mathematics.

As the QEP developed, mathematics workgroups met to discuss the current Intermediate Algebra course, student learning issues, and the QEP. To determine the level of support needed and identify any potential concerns, mathematics faculty were polled. Table 2-5 below illustrates the questions and results of the poll.

Table 2-5: Mathematics Faculty Opinion Poll

1. Do you think that Intermediate Algebra needs improving?
A. MAT 1033 needs improvement (18 responses)
B. MAT 1033 is fine the way it is (0 responses)
2. How eager are you to be involved in the QEP?
A. You are eager to be involved in the QEP (11 responses)
B. You would like to be involved, but are not enthusiastic about it (5 responses)
C. You hope you do not have to be involved (0 responses)
D. You are willing with reservations (2 responses)
3. What concerns do you have about the QEP?
Responses included: the time involved, lowering standards, changes being bogged down by a few people with set ideas, being judged by other faculty, being forced to teach a certain way, money and resources to make effective changes, pursuing latest trends and ignoring our own experiences, changing too many things at the same time, someone else making all the decisions, influence of compromises, and sustaining the changes after five years.

Additional college-wide Mathematics Department meetings and e-mail discussions that focused on student learning issues in MAT 1033 were held and included adjunct faculty who were teaching MAT 1033. Guided by SACS' definition of learning, "changes in (1) knowledge, (2) skills, (3) behaviors, or (4) values" (*Handbook for Institutions Seeking Reaffirmation,* p. 39), mathematics faculty explored ways in which learning in MAT 1033 could be improved. The mathematics faculty also utilized the literature, data points, and conference reports during discussions, which resulted in identification of potential implementation ideas for the QEP Committee.

In addition, the discussions enabled mathematics faculty to identify two immediate needs that math faculty subcommittee members later addressed: a) revision in the wording of course objectives and b) a slight revision in the course content, removing any extraneous topics that were not specified by the statewide course numbering system and were not needed for preparation for the next course. By revising the course objectives and course content, MAT 1033 now more closely reflects the student learning outcomes. The topics supporting the student learning outcomes can be focused on and taught more thoroughly, thereby better preparing students for the subsequent course.

Implementation Team

The Implementation Team collaborated with other QEP teams to brainstorm and develop ideas for implementation. Proposed implementation strategies were discussed and evaluated to ensure that selected strategies were anchored in the literature. Furthermore, input from other teams was sought to determine if the implementation ideas generated might be consistent with the purpose and goals of the QEP, and viable strategies were considered for further development.

Assessment Team

The Assessment Team worked closely with the Implementation Team to determine which strategies to implement and the appropriate assessment tools to measure the outcomes. The Assessment Team found that many of the current assessment tools at Polk State College could be utilized: a) mathematics departmental exams; b) *Student Perception of Instruction* (the college's assessment instrument in which students evaluate faculty), with additional questions; and c) the *Community College Survey of Student Engagement* (CCSSE).

Additional assessment tools are also planned to be used for the QEP: a set of rubrics created by Dr. Phyllis Blumberg for instructors to self-assess their progress along the continuum toward learner-centered teaching. A self-assessment model was selected to alleviate mathematics faculty's concerns regarding being judged by their peers, a concern that appeared in the *Mathematics Faculty Opinion Poll* (see Table 2-5). This concern was taken into consideration in determining how to use Dr. Blumberg's rubrics. In addition, the rubrics will enable each professor to choose his or her own specific areas of focus and quality enhancement in the move toward more learner-centered teaching. The Assessment Team also determined whether or not each assessment instrument would effectively measure the outcomes and when it should be administered.

Budget Team

The Budget Team worked closely with the Marketing and Implementation teams to ensure all items and activities were integrated into the budget. The Budget Team also identified funding sources for the project. For example, to reduce the cost of the QEP, the Budget Team worked with

the Polk State College Foundation, which provided financial incentives for several of the marketing activities, such as the logo design and poetry contests.

QEP Engagement Activities

To provide focus and to facilitate further understanding of the level of commitment needed to successfully develop and implement a QEP, mathematics faculty, administrators, and QEP Committee members attended several conferences and sponsored institutional professional development activities. Conferences attended included two SACS Summer Institutes (July 2008 and 2009), the 35th AMATYC Annual Conference (November 2009), the Teaching Professor Conference (May 2009 and May 2010), and the League for Innovation in the Community College's Learning College Summit (June 2010). The purpose for attending some of these conferences was to learn more about current best practices in the teaching of mathematics and to disseminate the information to various individuals associated with the development of the QEP.

College-wide collaboration and engagement in professional development as part of the QEP were evident in many other activities. For example, the institution's 2009 Fall Convocation revolved around the QEP wherein college constituents were apprised that the QEP is an opportunity to improve student learning and that any program of study a student pursues necessitates successful completion of at least one mathematics course. The attendees were also engaged in a QEP question-and-answer discussion. During the faculty meeting following the convocation, faculty representatives from the QEP Committee provided a presentation on the development of the QEP. They also provided an update on the QEP's status and facilitated an activity on learner-centered teaching techniques.

Various resources were procured as part of professional development activities: a) Nilson's (2003) *Teaching at its Best: A Research-based Resource for College Instructors*, b) Blumberg's (2009) *Developing Learner-centered Teaching: A Practical Guide for Faculty*, c) Bruff's (2009)*Teaching with Classroom Response Systems: Creating Active Learning Environments*, and d) O'Brien, Millis, and Cohen's (2008)*The Course Syllabus: A Learner-centered Approach*. These books were made available to the mathematics faculty and the QEP Committee. Based on recommendations from committee members, the library also purchased books related to the QEP theme, which were placed on library reserve for faculty and staff to peruse. A complete list of all books purchased is presented in Appendix D.

Through the literature review and professional development activities, learner-centered teaching emerged as a best practice. Consequently, Dr. Maryellen Weimer, a leading authority on learner-centered teaching, conducted a workshop at Polk State College. After the general faculty workshop, Dr. Weimer met with the mathematics faculty to contextualize learner-centered teaching in mathematics classes.

During the development process of the QEP topic, in addition to learner-centered teaching, two other areas emerged as possible components of the QEP implementation: providing a supportive learning environment and incorporating technology. In response to possible inclusion of a supportive learning environment as part of the QEP, a Gregorc Learning Styles workshop was conducted. Several technology-training sessions were also offered, such as the use of flip-cameras (small, easy-to-use, hand-held video cameras) and clickers (student

response systems) in the classroom. (See Appendix E for a summative outline of the activities in the selection and development phase of the QEP.)

Developing a Purpose Statement and Goals

Based on review of the literature, data, and conference information, the QEP Committee and mathematics faculty began composing a list of ideas and possible implementation strategies. The list was categorized into four major focal areas: learner-centered teaching, a supportive learning environment, professional development, and technology usage. However, the groups decided that professional development and technology usage should be integrated into learner-centered teaching and supportive learning environment strategies.

Because of variations in the definition of learner-centered teaching in the literature, the QEP Committee recognized that agreement on this critical topic was imperative, and the following definition of *learner-centered centered teaching* was adopted for Polk State College:

> Learner-centered teaching is an instructional design which intentionally and purposefully creates an environment that engages students as active partners in their own learning processes through meaningful interaction with course content, the professor, and each other. It presents increasing opportunities for learners to take responsibility for their own learning with the goal of becoming self-directed, life-long learners. Learner-centered teaching supports this process through defining clear objectives and integrating formative and authentic assessment into the learning process.

Similarly, with the inclusion of a supportive learning environment as one of the focal points, a need to define *supportive learning environment* arose. The following definition was derived:

> A supportive learning environment is a positive and encouraging classroom atmosphere where students feel comfortable, valued, and secure enough to ask questions, seek help, and respond to questions even if they are unsure of their responses (Brophy, 2004). Faculty are accessible and responsive to students both inside and outside the classroom and are engaged with other areas of the college such as the library, Teaching/Learning Computing Center, academic advising, and counseling as partners in student learning.

The QEP's purpose evolved into the following: to improve student learning in Intermediate Algebra (MAT 1033). With improved learning, students will be more successful in Intermediate Algebra so that they may more readily progress toward further academic and/or career goals. From the stated purpose, two goals were derived:

Goal 1: Student learning in Intermediate Algebra (MAT 1033) will improve.

Goal 2: The learning environment for Intermediate Algebra students will be supportive.

Relationship of the QEP to Polk State College's Vision, Mission, and Strategic Plan

The QEP Committee established a cogent and active connection between the institution's vision and mission statements, its strategic plan, and the proposed activities of the QEP. More specifically, the Committee proposed that the QEP provided Polk State College the

opportunity to further enhance the stated vision of College: *Polk State College will be a world class college and Florida's leader in workforce development.*

It is expected that with increasing mathematics proficiency levels, students will be better prepared to meet 21st century workforce requirements. Moreover, the desired impact of the QEP implementation on student retention and success rates correlates with two core components of the institution's strategic goals as defined in objectives 1.2 and 1.3 of the College's Strategic Plan 2007-2012:

- 1.2: Increase student retention and annual FTE enrollment across credit and non-credit courses.
- 1.3: Enhance student success, particularly across all levels of remedial education.

Kuh, Kinzie, Schuh, and Whitt (2005) suggested that colleges and universities have had higher graduation rates and higher scores on the *National Survey of Student Engagement* (NSSE) when: (a) institutional priorities are aligned with and are driven by the college mission, (b) student performance is monitored, and (c) data are used in the decision-making process.

Thus, the QEP Committee discussed how improving learning in Intermediate Algebra (MAT 1033) supported the mission of the College (see also page 6). Specific elements of the mission statement were examined in order to direct and ensure alignment of the QEP with the college's mission. The relationship between core components of both Polk State College's mission and its QEP is depicted in Table 2.6 below.

Table 2-6: Alignment between QEP Elements and Polk State College's Mission

Mission Elements	QEP Elements
quality-driven	An underlying goal of the QEP is to improve the quality of instruction as well as the quality of learning that takes place.
committed to student learning	Transitioning from instructor-centered teaching toward learner-centered teaching is one of the goals that evolved out of the QEP process. By aiding the transition from instructor-centered teaching toward learner-centered teaching and providing a supportive learning environment, the QEP demonstrates the commitment to student learning.
achievement	Desired results of the QEP are that students will be successful in Intermediate Algebra (MAT 1033) and successful in the subsequent course.
consistent practice of collaboration	The process itself of developing the QEP has been a work of collaboration throughout the College. Additionally, as part of the QEP, both full-time and adjunct Intermediate Algebra (MAT 1033) professors will meet regularly to collaborate on implementation strategies. Additionally, students will participate in collaborative learning activities in the classroom. The Mathematics Department will collaborate with Student Services, the TLCC (Teaching/Learning Computing Center), and the library to provide support for the student.
focus on excellence	Professors will attend conferences and workshops that focus on student learning. They will strive for excellence in teaching by being familiar with best practices and by implementing them in their classes.

Chapter 3: Identification of the Topic

College students nationwide are not performing well in mathematics; therefore, the United States is falling behind in producing a competitive workforce. According to the *Spellings Report*, "'Where once the United States led the world in educational attainment, recent data from the OECD indicate that our nation is now ranked 12th among major industrialized countries in higher education attainment. Another half dozen countries are close on our heels'" (as cited in U.S. Department of Education, 2006, p. xii.).

Students in mathematics classes in colleges and universities across the United States are experiencing an alarming rate of failure. They are struggling with the inability to complete mathematics classes, and standardized testing reveals that a large proportion of students is unable to demonstrate competence in the most basic of math skills. In fact, most community college students require remediation in basic math skills and find themselves in preparatory courses that do not contribute toward college credits for graduation. For many, the obstacles to college-level learning prove to be too daunting, and the pursuit of a college degree terminates with the formidable gatekeeper—Intermediate Algebra.

Students who do pass remedial mathematics courses and advance into college-level courses often continue to struggle with higher mathematics concepts and skills (Theil, Peterman, & Brown, 2008). Nationally, only 10% of students who enter community college at the lowest level of college preparatory mathematics complete a degree. The extensive dearth of math and science skills is projected to generate an underprepared U.S. workforce, while jeopardizing long-term global workforce competitiveness (Theil et. al., 2008). A 2009 global education study reveals that the U.S. is the only country whose younger population (age 25-34) does not exceed the upper-secondary educational attainment of the older generation (age 55-64); for all other countries, the upper-secondary education of the younger population exceeds that of the older generation (Organisation for Economic Co-operation and Development (OECD), 2009).

Current state- and college-level data support the rationale for launching an institutional study to determine the most effective course of action to enhance student learning and success. The following data has been reviewed over a two-year period and is discussed in more detail in the following sections:

Comparative Background Data:

- First-Time-in-College (FTIC) Student Progression by College Readiness
- Statewide Student Success Rates in MAT 1033

Focus Group Data:

- Student Focus Groups
- Mathematics Tutor Focus Group

Faculty and Student Survey Data:

- Mathematics Faculty Survey
- Student Mathematics Survey

College Course Data:

- FTIC Enrollment and Mathematics Readiness
- Course Enrollment in MAT 1033
- Course Pass Rates for MAT 1033
- Retention Rates of MAT 0012, MAT 0024, and MAT 1033 Students

Supplementary Data:

- Institutional QEP Survey
- Student Perception of Instruction Survey
- Community College Survey of Student Engagement (CCSSE) Report
- End-of-Term Examination results for MAT 1033

Comparative Background Data

Between 1999 and 2007, the Division of Community Colleges of the Florida Department of Education provided data from two system-wide longitudinal studies that tracked student progression for First-Time-in-College (FTIC) students entering the system during the fall terms of 1999 and 2001. The data showed the impact of developmental/remedial education needs of FTIC students on student success, and particularly on the proportion of students who had either obtained a two-year degree or transferred to a state university within a period of six years.

The data not only demonstrated that more Polk State College students were in need of developmental math education (71.3%) compared to the state system's average (67.1%), but it also illustrated that only 13.8% of those students were able to complete or transfer in that period of time, compared to 19.6% for the state system. Table 3-1 compares the various FTIC sub-groups and their 6-year completion rates in more detail.

Table 3-1: FTIC Student Completion Rates as a Function of Remedial Need

College Readiness of FTIC Cohorts	Percentage of Students in Need of Remediation		6-Year Completion Rate	
Cohort Segment	**Florida**	**Polk State College**	**Florida**	**Polk State College**
College Ready	24.0%	19.3%	44.7%	46.8%
Placed Into College Prep Reading Only	3.9%	6.1%	41.8%	31.2%
Placed Into College Prep English Only	1.3%	1.3%	36.7%	38.7%
Placed Into College Prep Math Only	23.8%	26.4%	24.6%	**17.9%**
Placed Into All College Prep Areas	24.8%	25.7%	14.2%	**10.2%**
Placed Into College Prep Math or Into Math plus Another Area	**67.1%**	**71.3%**	**19.6%**	**13.8%**
Total Cohort			27.3%	21.6%

Statewide data was published in an effort to compare course-level outcomes of MAT 1033 as the key mathematics gatekeeper course (a credit course with significant impact on a student's progression toward the intended degree) across colleges of the system. This system-wide data revealed that the overall completion rates for students in Intermediate Algebra at Polk

State College were either the lowest or second lowest in the Florida College System for three consecutive years.

Table 3-2 shows the abbreviated ranking (top five and bottom five) for completion of the gatekeeper course MAT 1033 with the grades A through C across the state college system for 2005, 2006, and 2007. While the average A-C pass rate for the system was 55%, the Polk State College average was only 41% for the three-year period. Closing this significant gap was one of the prime motivators for developing a QEP with a focus on this particular gatekeeper course.

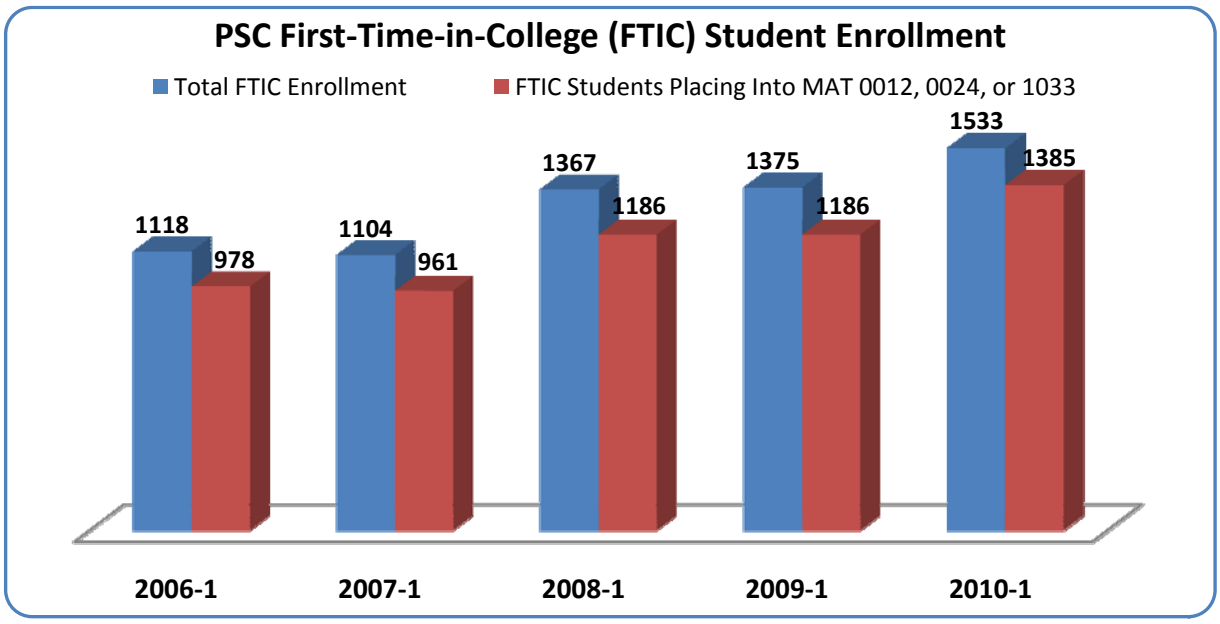
Table 3-2: Florida College System (FCS) Student Success Rates in Intermediate Algebra

Rank	2005	A-C	2006	A-C	2007	A-C
1	Florida Keys	79%	Florida Keys	76%	Florida Keys	80%
2	Edison	72%	North Florida	65%	North Florida	66%
3	North Florida	65%	St. Johns River	65%	Valencia	65%
4	Pasco-H.	64%	Okaloosa-W	63%	Okaloosa-W	62%
5	St. Johns River	63%	South Florida	62%	St. Johns River	62%
FCS SYSTEM AVERAGE		**55%**	**SYSTEM AVG.**	**54%**	**SYSTEM AVG.**	**56%**
24	Manatee	46%	Lake City	45%	Hillsborough	49%
25	St. Petersburg	45%	Lake-Sumter	44%	St. Petersburg	49%
26	Tallahassee	45%	Broward	43%	Tallahassee	48%
27	**Polk**	**43%**	St. Petersburg	43%	Broward	43%
28	Broward	42%	**Polk**	**38%**	**Polk**	**41%**

College Course Data

An additional set of data underlines the importance of the successful completion of math prerequisites. Figure 3-1 displays FTIC fall enrollment for the last five years. It also shows that on average 87.6% of these cohorts tested below the math requirements for college-level algebra, making math success, particularly in MAT 1033, pivotal to the progression of students into college-level coursework.

Figure 3-1: FTIC Enrollment and Math Readiness



Furthermore, Figure 3-2 illustrates the total enrollment in MAT 1033 during the terms analyzed and the proportion of FTIC students as part of this enrollment. The fact that on average less than 25% of FTIC students contributed to the total course enrollment indicative of the failure and withdrawal rates that increasingly led to the need for re-enrolling in the course. This continuous, steep increase in repeated MAT 1033 enrollment emphasizes again the need for the College to take a closer look at the conditions that lead to success or failure in Intermediate Algebra and to close the gap between the overall course pass rate in MAT 1033 and the pass-rate average for all of Polk State College's credit courses (see Figure 3-3).

Figure 3-2: Course Enrollment in Intermediate Algebra

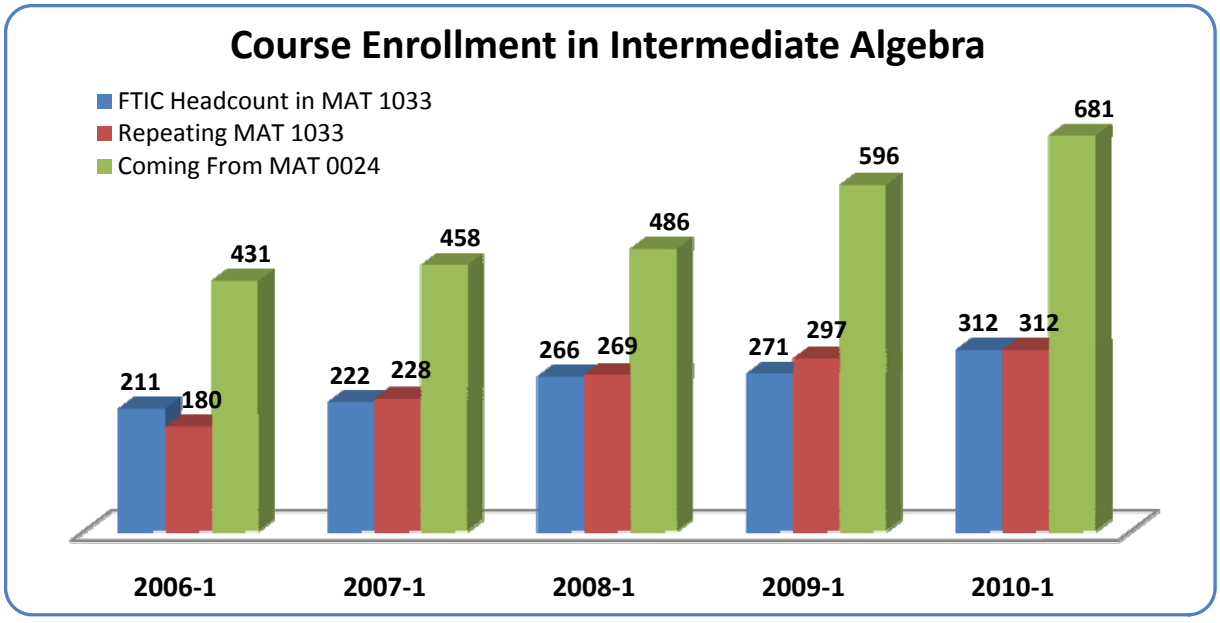
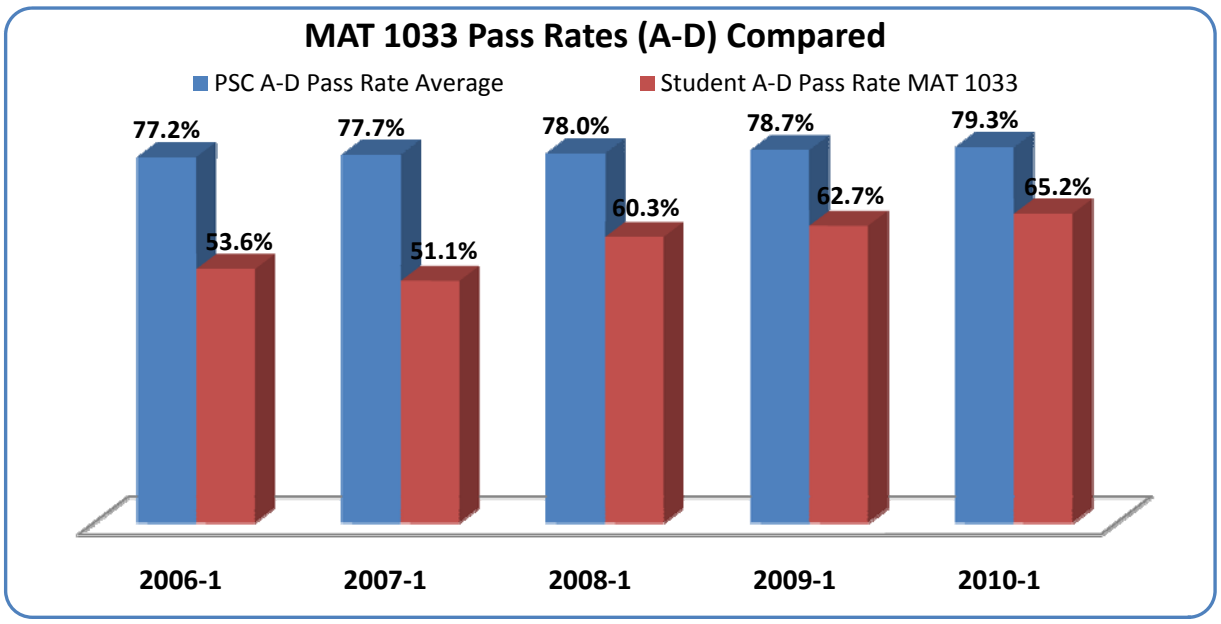


Figure 3-3: MAT 1033 Pass Rates



In addition to the impact on student success rates, surmounting math hurdles is also a crucial element for student retention. Table 3-3 illustrates the effect of not passing any of the College Algebra prerequisite math courses during the fall term on retention percentages for the following spring term. With an attrition percentage of almost 77%, MAT 1033 again leads the statistics for negative course-related impact on student retention.

Table 3-3: Fall-to-Spring Student Retention Rates

Course	Percentage of Students Retained During Spring Term Passing Class in Fall	Percentage of Students Retained During Spring Term Not Passing Class in Fall
MAT 0012	64.62% (1549)	25.51% (643)
MAT 0024	61.06% (1813)	25.28% (530)
MAT 1033	55.22% (1168)	23.31% (225)

The data demonstrate that achieving college-level math skills is a considerable obstacle at Polk State College, a problem that not only impacts student learning in mathematics, but also continually impedes the success of a substantial number of the college's students, adversely affecting learner success and retention, repetitively requiring additional resources, and creating for many students an academic barrier that seems impossible to overcome.

As a result, Polk State College identified mathematics as the subject of utmost concern and most in need of substantive intervention; therefore, student improvement in mathematics as the theme for the QEP development process was the most logical step. The mathematics faculty embrace the opportunity to help students make significant progress and are determined to use the QEP opportunity as a medium to improve learning.

Focus Group Data

To identify specific math concerns from a student point of view and to develop student survey questions, the Focus Group Team conducted student focus groups. Table 3-4 provides a list of the questions and a summary of the responses received from students. It also provides a succinct summary of students' perceived obstacles to success and rationale for failure in algebra courses. Additionally, in almost all conversations, Intermediate Algebra (MAT 1033) was described as the more formidable roadblock in comparison to Basic Algebra (MAT 0024). In the course of the focus-group sessions, different students talked frequently about the same instructors, and depending on personal preference and learning style, what turned out to be a good match for one, was an unsuccessful experience for the other. However, faculty-student interactions were almost always at the center of the conversation.

These additional findings were constructive in the discovery process and formed the avenue to the conclusion that while the whole developmental math education chain is of pivotal importance, MAT 1033 is a key gatekeeper course and therefore provides an authentic opportunity to fundamentally impact student learning, not just in mathematics, but in subsequent science courses as well. The full focus group report is provided in Appendix F.

Table 3-4: Student Focus Group Summary

Focus Group Questions (abbreviated):
What were your expectations of Basic Algebra or Intermediate Algebra?
If you passed the course the first time you enrolled, what did you do to successfully complete it?
What did your instructor do to help you to be successful in the course?
What advice would you give a student who just enrolled in Basic or Intermediate Algebra?
How can we improve the learning experience in our math courses?
Summary of Responses:
Math anxiety/confidence is a big factor for failure/success.
Professor's "negative attitude" was a frequently mentioned issue.
Tutoring options essential for many if not most "to make it through."
Trouble understanding the instructor, getting support, or getting their questions answered.
Scheduled workgroups and peer support are perceived as helpful.
Underlying math education and lack of conceptual understanding among principle issues.
Students want more frequent testing on fewer chapters to ensure they understand the material.

Since tutoring had been described by students as essential to their course success, a tutor focus group was conducted in June 2009, and the results largely mirrored the commentary of the student focus groups, corroborating the findings of the initial focus group results. The following points were derived from the discussion:

- Students struggle with comprehending and utilizing basics mathematics; there is great trepidation learning the basic functions; many are overwhelmed and feel like giving up.

- Professors have divergent teaching styles; students have dissimilar needs; tutors often need to explain solutions differently.
- Thirty percent of the students go to tutors in the TLCC because they are in a class that exceeds their mathematical prowess, and they struggle with finding answers.
- Many students say, “My professor did not tell me that,” or “This book is so hard to read and understand.”
- Tutoring provides the one-to-one attention students need. Students perceive that professors do not have the time or do not give them the attention they need to explain the concepts.
- If the College could assist students in resolving their issues with basic mathematical fundamentals, students could significantly improve.

Faculty and Student Survey Data

The various focus group results were used to develop math-specific surveys for Polk State College students and faculty, and both surveys were administered during the fall term of 2009. Of the 42 faculty members participating in the faculty survey, about an equal amount of full-time and part-time mathematics faculty provided input; of the 1,081 students completing the student survey, an almost balanced proportion of full-time and part-time students participated.

The faculty survey results revealed that about 50% of the respondents are using comprehensive lectures, 28% are using mini lectures, and only 16% are using active learning as their main instructional methods. While active learning was the single instructional method most instructors use to some degree, on average it accounts for less than 20% of the reported utilization of course time. Small group learning activities (8.9%) and student presentations (1.6%) comprise an even less significant share of the total instructional time in class.

Furthermore, only 63% of faculty reported that they are using collaborative learning strategies in their course work, with 69% reporting that they do not ascertain any information about their students’ learning styles. This tendency toward traditional, less engaging methodologies becomes even more noticeable when comparing preferred teaching strategies with the effectiveness ratings faculty associate with each of the strategies.

While about 75% of the participating faculty identified command and practice strategies (teacher makes all the decisions; students carry out teacher-prescribed tasks) as their primary mode of instruction, many of them do not appear to practice in class what they consider theoretically as a successful avenue to student success.

When comparing the self-rated application of instructional strategies by faculty with their own valuation of effectiveness of those strategies, some contrasts emerge. Table 3-5 below shows the frequency of actual use in class (A) for each of the instructional strategies displayed in column one. Interestingly, the rating of effectiveness (B) for several strategies that reflect components of a more learner-centered environment (see highlights) is much higher than their actual utilization, as the last column of the table shows. This, together with strong inter-faculty variances, indicates an instructional-redesign imperative.

Table 3-5: Faculty Ratings of Instructional Strategies

Instructional Strategies	A. Used in Class	B. Rating of Effectiveness	Gap B-A
Command - Teacher makes all decisions.	66%	74%	8%
Practice - Students carry out teacher-prescribed tasks.	83%	97%	14%
Reciprocal - Students work in pairs: one performs; one provides feedback.	20%	77%	57%
Self-check - Students assess their own performance against criteria.	48%	77%	29%
Inclusion - Teacher planned. Student monitors own work.	47%	66%	19%
Guided Discovery - Students solve teacher-set problems with assistance.	75%	91%	16%
Divergent - Students solve problems without assistance from the teacher.	41%	56%	15%
Individual - Teacher determines content. Student plans the program.	9%	26%	17%
Learner Initiated - Student plans own program. Teacher is advisor.	3%	29%	26%
Self Teaching - Student takes full responsibility for the learning process.	12%	26%	14%

In addition, 57% of faculty reported that they spent less than 25% of their weekly office hours helping students, while only 7% stated that they spent 75%-100% on that purpose. These numbers appear to be low and must come as a surprise, especially considering the strong support needs of students (60% of the students participating in the Student Math Survey indicated that they felt somewhat or less prepared to take the course and the same amount felt somewhat or less comfortable with taking MAT 1033). Perhaps this is another indicator of a student-faculty “disconnect,” especially when taking into account that participants in the student survey involved a large proportion of MAT 1033 completers with better than average course outcomes.

Another piece of evidence for the differences in student and faculty perceptions is provided in Table 3-6. In both surveys students and faculty were asked what they thought the barriers were to students learning in math. When comparing the results from both surveys, the main differences in the attribution of math barriers (Gap S-F) illustrate this strongly. It is noteworthy that no significant differences in math-barrier perceptions existed between students that passed MAT 1033 and those failing to pass the course on the first attempt.

Faculty believe, on average, that the main barrier for students is an insufficient base of mathematical knowledge (40.8%), followed by learner inadequacies to adapt to the course requirements, such as lack of engagement (27.2%). Students, on the other hand, believe that course content and faculty evaluation practices (30.7%) are the prime barriers, while the other factors play a much less significant role. In addition, student responses rank many factors, which are barely recognized by faculty as a potential barrier, at 5% or higher (e.g., Inadequacy of Instruction: 7.7%).

Overall, this data delineates a clear indication that faculty strategies to further student learning in MAT 1033 could be more substantially informed by an improved understanding of

the learner's viewpoint, particularly the ability to see the challenges of the learning experience through student perceptions and adapt their instructional strategies accordingly.

Table 3-6: Barriers to Student Learning in Math – Student and Faculty Perceptions

Category		Student %	Faculty %	Gap S-F
1	Student Mental Barriers to Math	1.1%	1.1%	0.0%
2	Inadequacy of Instruction	7.7%	1.5%	6.1%
3	Student Inadequacy/Engagement	13.3%	27.2%	-13.9%
4	Student Outside Commitments	4.1%	1.8%	2.3%
5	Classroom/Course Factors	1.9%	0.0%	1.9%
6	Math Subject Matter	6.4%	1.8%	4.6%
7	Textbook/Materials	2.6%	0.0%	2.6%
8	Specific Math Deficit Areas	5.2%	1.2%	4.0%
9	Long Time Since Math Exposure	1.8%	0.0%	1.8%
10	Lack of Base Knowledge	5.9%	40.8%	-34.8%
11	Class Content/Grading	30.7%	11.6%	19.1%
12	Outside Resources	5.4%	1.8%	3.6%
13	General Communication Issues	2.6%	0.0%	2.6%
14	General Inability to do Math	5.5%	2.1%	3.4%
15	Miscellaneous	5.7%	9.1%	-3.4%

Conclusions

SACS' *Handbook for Institutions Seeking Reaffirmation* states that the QEP should describe "a carefully designed course of action that addresses a well-defined and focused topic or issue related to enhancing student learning" (p. 35) and that it "is an opportunity for the institution to enhance overall institutional quality and effectiveness by focusing on an issue or issues the institution considers important to improving student learning" (p. 35). In addition, the *Spellings Report* says, "'While educators and policymakers have commendably focused on getting more students into college, too little attention has been paid to helping them graduate'" (U.S. Department of Education, 2006, p. 13).

In accord with these premises, the QEP Committee wanted the Quality Enhancement Plan to have a widespread impact; improving the way students learn in Intermediate Algebra is designed to accomplish this goal. At Polk State College, the associate in arts (AA) degree and all associate in science (AS) degrees require students to either pass Intermediate Algebra (MAT 1033) or achieve a college-readiness score that gives them immediate access to higher-level math courses. Because, on average, only about 15% of freshmen achieve such a score, the vast majority of students must pass MAT 1033.

These students will need to take Intermediate Algebra, or perhaps even college preparatory classes (77%) before they can take a college-level mathematics course that will fulfill graduation requirements. Currently, the success rate (5-year average) at Polk State College for students taking MAT 1033 on the first attempt is 56%. Many students end up taking MAT 1033 two or three times. Often they become discouraged because of the time and cost involved, especially if they had to take college preparatory math classes first. Even if students are successfully completing their other college courses, the mathematics requirement becomes an increasingly difficult barrier to overcome.

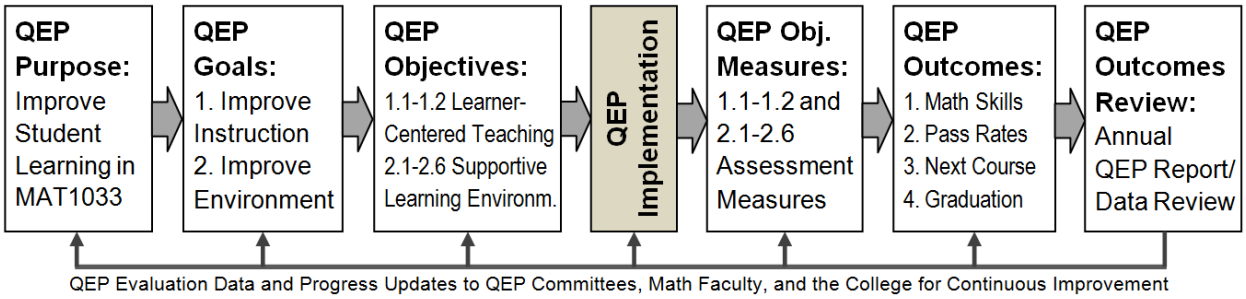
When students first enroll at Polk State College and discover the mathematics requirement for an AA or AS degree, they may not find excessive the requirement of two math courses for an AA and only one math course for an AS degree. However, when students start facing the realities of the actual course-related demands in combination with their own math-competency issues – most of which pre-date high school – fear and apprehension aggregate in combination with demanding class schedules, and for many this is either the beginning of a long struggle or the end of their attempt to complete a college degree.

Thus, as an institution that deeply cares for the accomplishments of its students, Polk State College has wholeheartedly concluded that the issues surrounding mathematics as a gatekeeper must be addressed, and that student success in college-level mathematics must be improved. Polk State College views this QEP as an opportunity to improve student learning outcomes in Intermediate Algebra beyond the scope of merely diminishing an instructional gap, but also to engage on a journey that is designed to ultimately expand the philosophy and pedagogy of a learner-centered educational environment into the day-to-day classroom experience of all of its students. The evidence has spoken; the College has listened and will act.

Chapter 4: Student Learning Outcomes

Colleges must establish clearly defined connections between learning outcomes and outstanding practices (Kuh, 2008). The flowchart in Figure 4-1 depicts the relationships among the QEP purpose, goals, objectives, outcomes, and review designed for continuous improvement.

Figure 4-1: QEP Flowchart



Purpose of the QEP

A statement of purpose was developed and evolved over time into the following:

The purpose of the QEP is to improve student learning in Intermediate Algebra (MAT 1033). With improved learning, students will be more successful in Intermediate Algebra so that they may more readily progress toward further academic and/or career goals.

Goals of the QEP

From the purpose, two goals were derived:

Goal 1: Student learning in Intermediate Algebra (MAT 1033) will improve.

Goal 2: The learning environment for Intermediate Algebra students will be supportive.

Using Assessment Data to Establish Performance Thresholds

Reviewing summative assessment data for MAT 1033 across four terms, as shown in Table 4-1 below, assisted with the development of target margins for the direct assessment of student learning outcomes of Goal 1 of this QEP.

Table 4-1: Summative Assessment Data for Student Learning Outcomes in MAT 1033

MAT 1033 Student Learning Outcomes	2008-2 F2F*	2009-1 F2F*	2009-2 F2F*	2010-1 F2F*	2010-1 DED**	Average
1. Solve and graph systems of equations and inequalities.	44.08%	53.26%	49.92%	54.22%	52.38%	50.77%
2. Perform basic operations with functions.	46.41%	45.39%	45.63%	51.72%	34.29%	44.69%
3. Factor polynomials and solve quadratic equations.	-	60.70%	56.12%	58.91%	60.00%	58.93%
4. Simplify and solve rational expressions and equations.	-	66.17%	62.00%	57.47%	42.86%	57.13%
5. Simplify expressions involving fractional exponents or radicals.	69.80%	76.67%	73.98%	72.03%	72.38%	72.97%

*F2F = face-to-face classes **DED = distance education

Objectives, Student Learning Outcomes (SLO), and Expected QEP Outcomes

Each goal along with its corresponding objectives and outcomes is examined below. Additional measurement detail and assessment logistics are available in Chapter 10.

Goal 1: Student learning in Intermediate Algebra (MAT 1033) will improve.

Objective 1.1: Students will demonstrate mathematical skills and competencies based on an end-of-course assessment in MAT 1033. Students will be able to:

SLO 1.1.1: solve and graph systems of equations and inequalities.

SLO 1.1.2: perform basic operations with functions.

SLO 1.1.3: factor polynomials and solve quadratic equations.

SLO 1.1.4: simplify and solve rational expressions and equations.

SLO 1.1.5: simplify expressions involving fractional exponents or radicals.

Objective 1.2: Full-time and adjunct faculty will demonstrate integration of learner-centered teaching practices in mathematics.

Expected Outcome 1.2.1: Students will experience learner-centered teaching strategies in their MAT 1033 instruction.

Expected Outcome 1.2.2: MAT 1033 faculty will progress annually in their learner-centered teaching.

Goal 2: The learning environment for Intermediate Algebra students will be supportive.

Objective 2.1: Students will experience a supportive learning environment in the classroom.

Expected Outcome 2.1.1: MAT 1033 students will have a positive first-day classroom experience.

Expected Outcome 2.1.2: Students will experience positive student-faculty interaction throughout their MAT 1033 instruction.

Objective 2.2: MAT 1033 Students will experience supportive course-related educational services by the TLCC.

Expected Outcome 2.2.1: Students using TLCC tutoring services for MAT 1033 will receive helpful support.

Expected Outcome 2.2.2: Students using TLCC computer services for MAT 1033 will have helpful experiences with the services received.

Expected Outcome 2.2.3: The use of the TLCC by MAT 1033 students will increase.

Objective 2.3: Students will experience library services as helpful with regard to their MAT 1033 coursework.

Expected Outcome 2.3.1: Students will have positive experiences with the educational support services of the library in regard to MAT 1033.

Objective 2.4: Students will favorably evaluate support from Student Services in regard to MAT 1033.

Expected Outcome 2.4.1: Students will report positive experiences when registering for MAT 1033.

Expected Outcome 2.4.2: Students seeking help for their MAT 1033 class from student services personnel will indicate a positive experience.

Objective 2.5: MAT 1033 students will positively experience the support of the College as a whole.

Expected Outcome 2.5.1: MAT 1033 students will discuss their degree or goals with someone who works at Polk State College.

Expected Outcome 2.5.2: MAT 1033 students will report that they made a personal connection with someone who works at Polk State College.

Expected Outcome 2.5.3: MAT 1033 students will receive high quality support concerning the achievement of their academic goals.

Objective 2.6: MAT 1033 students will persist in class and achieve their academic goals.

Expected Outcome 2.8.1: Students taking MAT 1033 will still be enrolled after the withdrawal date.

Expected Outcome 2.8.2: Students who are not successful in MAT 1033 will re-enroll in the course in the same or the following academic year.

Expected Outcome 2.8.3: Students successfully completing MAT 1033 will be retained at the College during the following academic year.

Expected Outcome 2.8.4: Students successfully completing MAT 1033 will either complete a degree at Polk State College or leave in good standing.

Expected QEP Outcomes

In an effort to devise QEP-specific outcomes relevant to student learning and success in MAT 1033, the QEP Committee deliberated A) What measurable changes in knowledge, skills, attitudes, or behaviors are desired? B) What is the resulting product that is expected from the QEP? and C) How will the student experience change after implementing the QEP? These questions led to the following overarching QEP outcomes:

- QEP Outcome #1: Students will demonstrate all five student learning outcomes under Goal 1, Objective 1.1.
- QEP Outcome #2: Students who take Intermediate Algebra will successfully complete it on the first attempt.
- QEP Outcome #3: Students who successfully complete Intermediate Algebra will be successful in the subsequent mathematics course.
- QEP Outcome #4: Students completing Intermediate Algebra will graduate in their selected degree programs.

Chapter 5: Literature Review

This literature review is an examination of current best practices being used to improve student learning in mathematics, specifically in Intermediate Algebra. The purposes of this review are three-fold: 1) identify possible causes of or factors that contribute to poor student performance in mathematics, 2) identify best practices, and 3) conduct a more in-depth review of the specific best practices that will enhance student learning through the institution's implementation of its QEP.

Possible Causes

Twenty-first century demands for a more mathematics-literate workforce have brought long-existing weaknesses in mathematics to the forefront of educational issues, necessitating examination and action, and fostering improvement initiatives. A review of the research in this area suggests that today's situation has actually existed for several generations (Klein, 2003).

Research, national reports, test scores, and educator and student feedback indicate that the United States is insufficiently responding to the increased demand for higher level mathematics in the workplace and in daily life in today's technology-rich world. "Workforce projections suggest a growing shortage of U.S. citizens having the kinds of technical skills that build on such courses as Algebra II" (Committee on Science, Engineering, and Public Policy, 2007). According to the Department of Labor and Statistics (Herman, 1999), the workforce is moving from an era in which strength and dexterity alone were enough to ensure employment to an era that requires employees to command verbal and mathematical skills in order to keep pace with emerging technologies, globalization, and the information revolution underway.

Additionally, as the workforce changes, enrollment in community colleges is increasing. More specifically, the number of non-traditional students entering colleges and universities across the nation has been steadily increasing. Howard and Henney (1998) determined that the percentage of nontraditional students in colleges and universities in the United States rose from more than 38% in 1991 to almost 46% in 1998 (Bell, 2003). Kinsella's (1998) data indicates that non-traditional students comprised nearly one-half of U.S. undergraduates in 1998, and many of these non-traditional students entered community colleges (Bell). With an average age of 28, most of these students were under-served and under-prepared and tested into developmental courses.

In 2006, according to the National Center for Education Statistics (Provasnik & Planty, 2008), 62% of community college students were part-time students compared to 27% at the 4-year colleges and universities. Community colleges provide unique opportunities for students who would not otherwise have access to higher education; however, the common thread observed in the high rates of student failure and attrition is the under-preparedness of entering students and the number of developmental courses that must be taken.

A review of the literature reveals that math anxiety is one of the most cited reasons for poor student performance in mathematics, and in many cases, math anxiety is the manifestation of a host of variables that affect student learning. Students with undiagnosed and untreated physiologically-based learning disabilities are likely to develop math anxiety issues as a result of early experiences with failure. Additionally, math anxiety can be a learned response initiated by a lack of active involvement and negative attitudes toward mathematics by both parents and

educators. Anxiety also has a deleterious effect on students' perception of their mathematics ability (Briggs, Sullivan & Handelsman, 2004).

In addition to math anxiety, a variety of other factors were found to affect performance in mathematics. Some of these include academic background (House, 2000), attitudes toward the subject material (Gupta, Harris, & Carrier, 2006), self-perceptions of overall academic ability (House, 2000), self-confidence (Parsons, Croft, & Harrison, 2009), the drive to achieve (House, 2000), and student-faculty interaction (Thompson, 2001). Thus, this literature review will focus on strategies and best practices that address math anxiety and other factors that affect student performance in mathematics as well as strategies and best practices related to student learning and performance in mathematics.

Best Practices

Through this review of literature, the Committee discovered best practices most suited to local needs, the capabilities of the institution, and the climate of the Mathematics Department, which would fit well within the framework of the QEP's goals: learner-centered teaching and establishment of a supportive learning environment.

An in-depth review of the literature exploring the selected best practices follows after Table 5-1, which summarizes the literature on each of these best practices. An additional, more detailed summary is provided as part of the *Chapter 5 Supplement* file included with this QEP submission.

Table 5-1: Synthesis of Best Practices

Selected QEP Implementation Options
Active Learning - is "anything that 'involves students in doing things and thinking about the things they are doing'" (Bonwell & Eison, 1991, p. 2). See: Blair (2006); Prince (2004); Springer, Stanne, and Donovan (1999); Bonwell and Eison (1991); Chickering and Gamson (1987).
Assessment - can be categorized as either formative (evaluation while learning is in progress), or summative (final evaluation at completion of learning period). See: Suskie (2009); Cizek and Andrade (2009); Martyn (2007); Blair (2006); Angelo and Cross (1993).
Learner-Centered Teaching - can be described as what and how the student is learning, under what circumstances learning takes place, and what the student is retaining and applying to facilitate future learning. Learner-centered teaching also transforms the role of the teacher from that of lecturer to a facilitator of knowledge (Weimer, 2002). See: Alsardary and Blumberg (2009); Bosch et al. (2008); Blumberg (2009); Doyle (2008); Thompson, Licklider, and Jungst (2003); Weimer (2002); Barr and Tagg (1995).
Professional Development - enables professors to keep abreast of new research or practices within a professional field while enriching and enhancing their knowledge (Bain 2004). See: Bain (2004); Blanton and Stylianou (2009); Slavit, Bornemann, and Haury (2009); Harris and Cullen (2008); Davys and Jones (2007); Galbraith and Jones (2006); Van Eekelen, Boshuizen, and Vermunt (2005); Daley (2003); Neptune (2001); Tinto (1998).

Student Engagement - is "participation in educationally effective practices both inside and outside the classroom" (Harper and Quaye, 2009, p. 2). See: Kuh, Kinzie, Schuh, and Whitt (2010)**;** Harper and Quaye (2009)**;** Pascarella and Terenzini (2005)**;** Tinto (1994).
Supportive Learning Environment - created by professors so that affective filters are lowered, and students feel safe to interact and take risks. See: Center for Community College Student Engagement (2009); Willis (2006); Briggs, Sullivan, and Handelsman (2004); Neptune (2001).
Technology-Enhanced Instruction - includes "the use of graphing calculators, student response systems, online laboratories, simulations and visualizations, mathematical software, spreadsheets, multimedia, computers or the Internet, and other innovations yet to be discovered" (Blair, 2006, p. 55). See: Martyn (2007); McCabe (2003); Sutton and Krueger (2002); Roueche and Roueche (1999); Kulik and Kulik (1986).
Rejected QEP Implementation Options*
Learning Communities - seek to encourage student engagement by organizing a curriculum or course around groups of students who progress through a curriculum, group of courses, or stated educational objectives together. See: Freeman, Alston, and Winborne (2008); Scrivener et al. (2008); Fischer and Sugimoto (2006); Tinto (1998); Tinto and Russo (1994).
Learning Styles - the way each individual concentrates on, processes, internalizes, and remembers new and difficult academic information or skills. See: Bonham (2007); McClendon and McArdle (2002); Felder and Brent (2005); Kolb and Kolb (2005); Dunn and Dunn (1993).
Mastery Learning - presents subject content in units with clearly developed learning objectives. Students work with content, individually or collaboratively, until they demonstrate mastery of each unit. See: Gusky (2007)**;** Davis and Sorrell (1995); Bloom (1985)**;** Carroll (1963, 1989).
Problem-Based Learning - "A curriculum development and instructional system that simultaneously develops both problem solving strategies and disciplinary knowledge bases and skills by placing students in the active role of problem-solver confronted with an ill-structured problem that mirrors real-world problems" (Finkle and Torp, 1995, p. 1). See: Reynolds and Hancock (2010); Gijbels, Dochy, van den Bossche, and Segers (2005); Shore and Shore (2003).
Study Skills - utilizing skills already used "in other areas of your life that leads to a more successful and relaxed semester" (Cusimano, 1999, para. 35). See: Eades and Moore (2007); Ross, Green, Salisbry-Glennon, and Tollefson (2006); Schwartz (2004); Cusimano (1998).
Supplemental Instruction - "a peer-assisted academic support program that is implemented to reduce high rates of attrition, increase the level of student performance in difficult courses, and increase graduation rates" (Martin & Hurley, 2005, p. 308). See: Fayowski and MacMillan (2008); Wright, Wright, and Lamb (2002); Kenney and Kallison (1994); Treisman (1992).
* Certain aspects of some rejected QEP implementation options, like *Learning Styles* focus have been integrated with the selected options.

Learner-Centered Teaching

Colleges are altering the way students and faculty interact through an instructional paradigm shift from the traditional transfer of knowledge, which emphasizes the delivery of instruction, to the learner-centered approach, which emphasizes improving the quality of instruction by focusing on each student's impetus to learn. This learning paradigm does not focus on a single model of one size fits all; rather it focuses on the practices a college can employ to affect the experience of the students (Tagg, 2003). In a learner-centered environment, students take greater responsibility for their own success while faculty are more fully engaged in facilitating students' efforts.

A consolidated review of Thompson, Licklider, and Jungst (2010); Alsardary and Blumberg (2009); and Barr and Tagg (1995) provides consistent and comprehensive guidance for progression from more traditional instructional methods to more learner-centered teaching. Situating the student at the center of learning, the learner-centered approach is oriented around the variables of student learning: what and how the student is learning, the environment for learning, and how current learning will affect the student's future learning (Weimer, 2002). Weimer (2002) offers five principles of guidance for a transition to more learner-centered teaching: a) *the balance of power* gives students some control of various learning processes; b) *the function of content* assists students in developing learning skills in addition to content knowledge; c) *the role of the teacher* is that of a guide and facilitator; d) *the responsibility for learning* helps students develop mature learning skills needed to be autonomous learners; and e) *the purposes and processes of evaluation* allows students to participate in evaluation. These key changes encompass a more comprehensive and integrated base for learning-centered teaching.

Faculty create an appropriate learner-centered environment with conditions that promote learning. In learner-centered teaching, interaction between teachers and learners is cooperative, collaborative, and supportive, whether the students are working together in teams or individually (Barr & Tagg, 1995). Since the focus in the learner-centered approach is on learning and learners, a supportive climate that advances learning outcomes should be created by faculty to encourage improved learning.

Similarly, maintaining a learner-centered approach fosters a climate that promotes students' abilities to develop into autonomous learners. Students are encouraged to move toward this goal through the implementation of learning principles that require students to accept responsibility for their own learning through self-regulation, defined as the effort students expend to improve their own learning (Ley & Young, 2001). Promoting the use of self-regulation to assist in achieving improved student learning is desirable (Ley & Young, 2001; Weimer, 2002). Embedding the following principles of self-regulated learning can better assist students to become autonomous learners: a) prepare and structure an effective learning environment, b) organize instruction and activities to facilitate cognitive processes, c) monitor progress, and d) evaluate performance on a task.

The shift from the instructor-centered paradigm to a learner-centered paradigm is a constantly evolving, dynamic process. Coupled with defining behaviors of self-regulated learning, this shift will empower college students to better understand how to reach educational goals.

Guided by the established principles of learner-centered teaching methodologies, the QEP Committee has sought to implement learner-centered teaching to improve student learning in Intermediate Algebra. This goal of improving learning through learner-centered teaching will incorporate several of the best practices previously cited to assist students. Engaging students in active learning through regular student-teacher contact, dialogue, and feedback will be a component of the QEP. Additionally, faculty will participate in professional development to enhance their knowledge and use of learner-centered teaching.

Supportive Learning Environment

Both national and institutional-level research indicate students' poor performance in mathematics is a result of poor perceptions of the content, anxiety, and discomfort with assessment practices; therefore, the QEP Committee has determined that establishing a supportive learning environment will serve as the second initiative to improve student learning in Intermediate Algebra. Because many students have a fear of mathematics, have lost or have never developed confidence in their own mathematical abilities, and fail to see the potential utility of math within their careers, engaging students in a mathematics class may be more difficult than in other subject areas (Briggs, Sullivan & Handelsman, 2004). Establishing a supportive learning environment can help alleviate this fear and anxiety.

Researchers have explored the role of faculty in promoting student learning through maintaining a supportive learning environment. The broad view is that the way in which the professor conducts him or herself within the learning environment has an impact on students' success. To this end, recent research has focused on faculty participation in creating a supportive learning environment. In the classroom, students want to be treated as people, not simply recipients of knowledge, so the professor must establish positive rapport to enhance the effectiveness of learning (Chickering & Gamson, 1987). This serves as a key motivational factor for students and fosters student engagement and personal connection. "Personal Connections" is one of the six design principles recommended by the Center for Community College Student Engagement (2009) to facilitate student success.

The Survey of Entering Student Engagement (SENSE, 2009) is also an instrument used by colleges to measure entering students' persistence and success rates. SENSE purports that benchmarking in the areas of early connections, high expectations and aspirations, clear academic plan and pathway, effective track to college readiness, engaged learning, and academic and social support network will help an institution. The overarching results of data collected by institutions pointed out that students who felt welcomed and connected increased their interaction in the classroom and engagement in other school-related activities (SENSE). Additionally, the emphasis on "Personal Connections" emphasizes students' relationships throughout the institution and not simply within the classroom.

Willis (2006) states that "before students can focus on academics, they must feel physically safe and emotionally secure" (p. 64), and that "if students feel safe and in control of their potential for success, they will experience a reduction in affective filters and a reduction in the test anxiety that may have lowered their test performance in previous years" (p. 77). Brophy (2004) suggests a "learning community" fosters optimal social context in a classroom, based on students feeling comfortable, valued, and secure enough to ask questions, seek help, and respond to questions even when they are uncertain of their responses.

To help build a learning community within the classroom, Brophy suggests that professors should be friendly and sincere and should learn their students' names. They should also allow students to know and appreciate them as people. This promotes a more open and genuine environment while maintaining an atmosphere of mutual respect. Professors should also encourage and help students to become acquainted with one another. The physical environment should be inviting, and classroom displays should relate to the curriculum (Brophy).

Factors that help establish a supportive learning environment are organization, high standards, mutual respect, caring, and enthusiasm (Neptune, 2001). Organization includes preparation, content mastery, time management, clear expectations, and arrangement of new ideas into context. Mutual respect is created through practicing fair, ethical, and equal treatment of students as human beings; giving prompt feedback on work handed in; and welcoming questions and responding in a patient manner. Caring includes nurturing, sensitivity, and accessibility, which brings warmth to the classroom and creates a community atmosphere. Enthusiasm for both teaching and the subject area needs to be obvious to students, both verbally and non-verbally (Neptune).

Best Practices to Support QEP Goals

Active Learning

Active learning is "anything that 'involves students in doing things and thinking about the things they are doing'" (Bonwell & Eison, 1991, p. 2). The American Mathematical Association of Two-Year Colleges endorses utilization of active learning principles within contemporary mathematics classrooms in recognition of the fact that the short attention span of the typical millennial student must be actively engaged for learning to occur (Blair, 2006). In order for active learning to be effective, activities must be designed around carefully crafted learning outcomes, and only those active learning strategies which promote student engagement are effective (Prince, 2006). Active learning strategies must be interesting and challenging to students in order for them to increase student learning.

In a meta-analysis of active learning strategies employed in science, mathematics, engineering, and technology courses, Springer, Stanne, and Donovan (1999) determined that active learning increases academic achievement and enhances students' attitudes toward the subject. Additionally, and perhaps most importantly, adoption of active learning practices in math and science courses increases persistence in future science, math, engineering, and technology courses.

Assessment

Although Benjamin Bloom is best known for his taxonomies of educational objectives, he was also a pioneer in academic assessment, popularizing the terms "formative" assessment (evaluations done while learning is in progress) and "summative" assessment (a final evaluation done when the learning period is complete). Bloom et al. (1971) published a landmark study that examined both the advantages and dangers of assessment. Concerned about "reducing the negative effect associated with evaluation," he and his co-authors believed that users of assessment data—teachers, curriculum makers, and students—should be the ones to evaluate it. Florida has been a national leader in summative assessment, instituting the CLAST (College-Level Academic Skills Test) in 1982 to evaluate college learning and the FCAT (Florida

Comprehensive Assessment Test) in 1998 to evaluate K-12 learning. These summative tests were included in the requirements students needed to fulfill in order to graduate.

In recent years, however, educators have become more interested in formative assessment. Less formal and more flexible than summative assessment, formative assessment allows students and instructors to make adjustments during the learning process. A synthesis of the research compiled by Black and William (1998) illustrates that formative assessment can profoundly affect student achievement. Having studied the increasing popularity of formative assessment, Cizek and Andrade (2009) purport that it offers learners, faculty members, and administrators' opportunities to adjust learning strategies and develop curricula to enhance student mastery of content.

The American Mathematical Association of Two-Year Colleges recommends "each faculty member will use multiple classroom-assessment techniques as an integral part of instruction to assess student learning and use those results to adjust instructional methods and materials" (Blair, 2006, p. 32). Martyn (2007) identified and described a type of student response system, commonly called "clickers," as useful formative assessment tools that increase student engagement.

Professional Development

As professors' careers progress, the opportunities to energize and further develop should be continuous. Without rejuvenation, a teacher can become stagnant in knowledge and techniques. The literature reveals that professional development should be intentionally interdisciplinary (ASHE, 2005), should provide opportunities for fostering intellectual development through mentoring (Darwin & Palmer, 2009), should use reflection and reflective practices (Pill, 2005), and should provide a framework of sustainability embedded in professional values at its heart (Martin, Summers, & Sjerps-Jones, 2007). Wacek (2003) found that professional development of faculty and staff was generally inadequate, with almost none for adjunct or part-time staff at any of the institutions that were examined. Evaluation of professional development is limited mostly to informal evaluations, student evaluations, and rates of successful completion, so there is a need to evaluate the efficacy and relevance of the professional development experience.

Professors should not remain isolated within their teaching schedules or disciplines (Slavit, Bornemann, & Haury, 2009), as they are responsible for making beneficial connections with other academic departments to improve student learning (Neptune (2001). Likewise, in the community, the professor has the responsibility of promoting the academic discipline and education in general and the responsibility of representing the college in a positive manner. Slavit, Bornemann, and Haury used a professional learning community to demonstrate how to change the culture of an academic community and its representatives.

Initiatives such as these can extend to other areas of the college to support learning-centered approaches. Daley (2003) offers the following strategies to enhance professors' efforts to develop learner-centered instructional settings: Professors should examine their own beliefs about teaching and learning, interact with other professors to enhance exchanges of learning strategies, and develop strategies to support knowledge construction and development of meaning.

Student Engagement

In association with the Indiana University Center for Postsecondary Research, George Kuh, one of the most respected authorities in the area of student engagement, has been tracking student engagement and publishing an annual report about its findings since 2000. More than 1.3 million undergraduates at nearly 1200 institutions of higher learning have been surveyed thus far.

As a result of this collaboration, the *Community College Survey of Student Engagement* has identified five benchmarks to measure effective student engagement (Center for Community College Student Engagement, 2009). Polk State College uses this instrument to measure student engagement. Furthermore, Harper and Quaye (2009) have added a sixth factor to the aforementioned five benchmarks: *shared responsibility*, defined as “participation in educationally effective practices both inside and outside the classroom” (p. 2).

Pascarella and Terenzini (2005) have focused their research on utilizing new directions in higher education to enhance student engagement. Their research focuses on the rising enrollment in community colleges, increasing numbers of non-traditional students, and a more complex understanding of learning. More specifically, instructional strategies should be adjusted to make content relevant to the diverse student body found on today’s campuses (Pascarella & Terenzini). Because “a substantial amount of knowledge is actively constructed by the learner,” colleges need to make greater use of active and cooperative learning strategies (p. 3).

Tinto (1994) has extensively studied the relationship between student engagement and retention. He proposes that the level of involvement in academic and social communities on campus affects students’ persistence (Lotkowksi, Robbins & Noeth, 2004)

Technology-Enhanced Instruction

As technological-resource use expands among students and professors, integrating technology into the curriculum is fast evolving as a major component of course content. Svinicki and McKeachie (2010) purport four major considerations of "teaching with technology”: a) clarifying curricula content through learning outcomes, b) assessing time needed for planning and teaching, c) assessing access to technology and students’ learning styles, and d) determining technology functions and relevance to teaching. Caverly and MacDonald (2006) describe the four levels of technology integration as adoption, adaptation, appropriation, and innovation, with many students and professors performing tasks at the lowest level such as the use of e-mail and word processing.

A divide between avoidance and acceptance of the use of technology takes into account various factors involved in teaching and learning. In an example of using calculators in mathematics, the results of a meta-analysis conducted by Ellington (2003) found that students’ mathematics skills in operations and problem-solving improved when students were allowed to use calculators in teaching and instruction. However, the final report of the National Mathematics Advisory Panel (2008) recommends that “calculators should not be used on test items designed to assess computational facility” (p. 61). A. Martin (2008) conducted a study regarding graphing calculator interventions and found instructors and students had varied responses at the end of the study. Some became more comfortable while others felt the calculators were confusing, complicated, and expensive.

On the other hand, the literature reveals that technology use is being embraced to enhance teaching and learning with a greater impact. Brothen (1998) recommends that technology can become a multiplier-effect concept if used correctly. He recommends using computerized quizzes with immediate feedback and retesting options. Students also learned about effective learning strategies with this feedback and how to improve them. This strategy proves to bring about better self-regulation strategies for students.

Several examples of the use of technology are highlighted in the literature, ranging from the use of course management systems and Web 2.0 tools to the use of clickers and virtual reality technology.

Rivero (2006) offers five dimensions for building better bridges involving technology use. They include the use of tablet PCs; course management systems that align curriculum standards and student objectives; Web 2.0 tools such as blogs, wikis, web logs, student response systems (clickers), and podcasts; interactive whiteboards; and shared teaching resources dealing with technology.

Martyn (2007) states clickers kept students actively engaged and provided immediate feedback to both instructors and students. Schiller (2009) used the technology of Second Life (virtual reality) as an assessment tool to measure learning outcomes of coursework. Schiller reported his initiative was successful in evaluating the learning objectives and learning process, and the students felt the project was fun, engaging, and effective in delivering the learner-centered experience (para. 55).

Summary

As the literature demonstrates, student success in mathematics courses is related to more than simple exposure to the content of a course. Maintaining a learning-centered approach and establishing a supportive learning environment have a positive effect upon student learning outcomes. Based on existing research, this is a particularly appropriate strategy for student populations that display a much broader spectrum of age, knowledge, backgrounds, career goals, and socio-demographic characteristics than traditional student cohorts.

To help students succeed in Intermediate Algebra (MAT 1033), mathematics professors, tutors, and the supporting college community must understand how these concepts undergird pedagogical practices in order to design and transform students' learning through more active engagement in and ownership of course content and their own learning processes. This would move Polk State College closer to the goal of empowering students while ensuring the college's continued effectiveness.

Through this Quality Enhancement Plan, the College can make a systematic and reflective evaluation of teaching approaches and strategies with a strong focus on the two initiatives of learner-centered teaching and a supportive learning environment within the MAT 1033 course with a firm commitment to the success of the community college student.

Chapter 6: Implementation

Implementation of the QEP entails a six-year process, including the pilot implementation phase of 2010 to 2011. The components of this process will involve significant cultural transformation within the interrelated network of the College through collaboration, professional development, data review, and extensive assessment. Modifications in instructional methodology and student support services will occur throughout Polk State College during the implementation period.

Changes in the Mathematics Classroom

The implementation of the QEP involves redesigning the way Intermediate Algebra is taught. The aim is to change the course from a gatekeeper course to a gateway course for students to pursue their academic goals. Each year at Polk State College, more than 100 sections of Intermediate Algebra (MAT 1033) are taught by 20 full-time and approximately 10 adjunct professors.

The purpose of the QEP is to improve student learning in Intermediate Algebra through redesigning MAT 1033 to include learner-centered teaching and a supportive learning environment. In Fall 2010 two classes will pilot the activities created as part of the redesign. Implementation will be phased in with approximately 30% of the sections in Spring 2011, 45% in Fall 2012, 60% in Spring 2013, 75% in Fall 2013, and finally maintaining at least 75% for the remainder of the implementation period.

Implementation will begin with full-time professors who are teaching face-to-face classes, and in Fall 2011 will begin to include adjunct professors as well as online sections. Summer will be a time to reflect. Thus, during the summer term, the redesigned course will be taught only by faculty who taught the course during the previous academic year. Table 6-1 below summarizes the initial QEP rollout while additional detail is provided in Table 7-1 of the *Timeline* chapter.

Table 6-1: Phasing in Learner-centered Teaching

Term	Estimated Portion of MAT 1033 Sections	Estimated N of Sections	Estimated N of Students	Including Adjuncts	Including Online Classes
Fall 2010	2 sections (see Note 1)	2	44	No	No
Spring 2011	30% of sections	12	264	No	No
Summer 2011	TBD (see Note 2)	5	110	No	No
Fall 2011	45% of sections	22	484	Yes	Yes
Spring 2012	60% of sections	25	550	Yes	Yes
Summer 2012	TBD (see Note 2)	10	220	Yes	Yes
Fall 2012	75% of sections	37	814	Yes	Yes
Spring 2013	At least 75% of sections	31	682	Yes	Yes
Continue with at least 75% each fall and spring term with professors teaching their first redesigned class in the fall or spring only.					
Note 1: Piloting materials **Note 2:** Only professors who taught MAT 1033 in the fall or spring					

Using Rubrics to Implement and Assess Change

Modeled after the pedagogy of Weimer and Blumberg, one of the main goals of Polk State College's QEP is to utilize learner-centered teaching in the redesigned MAT 1033 classes. Weimer (2002) has determined five dimensions in which changes need to be made in order for learner-centered teaching to occur, and these five dimensions form the cornerstones of Blumberg's (2009) detailed description of how to develop learner-centered teaching.

Based on Weimer's (2002) five dimensions (Function of Content, Role of the Instructor, Responsibility for Learning, Processes and Purposes of Assessment, and Balance of Power), Blumberg (2009) created rubrics to aid professors in determining how far they have transitioned along the continuum from instructor-centered to learner-centered teaching. Not only do the rubrics act as an assessment tool to measure the transition, but they also act as a guide indicating the changes that need to occur to progress toward learner-centered teaching. In all, as listed in Appendix G, there are twenty-nine components that make up the five dimensions. Appendix H illustrates the rubric for one of the dimensions.

To familiarize the mathematics faculty with the rubrics, Dr. Blumberg will hold a videoconference with the mathematics faculty in September 2010 and will conduct an all-day face-to-face workshop in October 2010. During the videoconference, the mathematics faculty together with Dr. Blumberg's assistance will determine approximately 15 of the 29 components that are pertinent to strengthening mathematics education at Polk State College. As part of the October workshop, all mathematics faculty will complete baseline data using the *Documentation to Support the Selected Status* form as shown in Appendix I. A second part of the workshop will be planning for Spring 2011. From the list of the 15 previously determined components, the mathematics faculty will select the component(s) they wish to work on for the year. All faculty planning to teach MAT 1033 will fill out the *Planning for Transformation* exercise for each component they plan to change. Appendix J shows the script of the exercise.

The aim is for each professor to move three progression steps along the continuum toward learner-centered teaching each year (two steps if teaching MAT 1033 during only one term). The three progression steps can all be in one component, but more likely will be one progression step in each of three components. It can also be two progression steps in one component and one progression step in another component. Dr. Blumberg will return each subsequent summer to assist with the rubrics and documentation. She will conduct workshops for faculty who may not have participated the first time, e.g., adjunct faculty and new faculty. In addition, she will conduct a more comprehensive workshop for those who have already used the rubrics.

Each summer a *Documentation to Support the Selected Status* form will be completed by each professor to self-assess and provide documentation explaining what was done and how it demonstrates movement to the next transition level. In addition to the narrative rationale of why the actions constitute movement to the next level, each professor will complete a checklist of actions that were implemented in the classroom during the previous year.

Transformational Activities

Because one of the primary objectives of the QEP is to improve student learning in MAT 1033, mathematics professors will be transitioning toward more learner-centered teaching methodologies. Weimer (2002) proposed five dimensions of learner-centered teaching:

1. The function of content – "…join content and learning in a dynamic relationship that benefits content acquisition and learner development…stop "covering" content and start "using" it to accomplish learner-centered objectives" (Weimer, 2002, p. 71). Examples of changes (Blumberg, 2009):
    - From: Instructor allows students to memorize content.
      To: Instructor encourages students to reflect on the content to make their own meaning out of it.
    - From: Students learn content without clearly defined organizing schemes.
      To: Instructor provides and uses organizing schemes to help students learn content.
2. The role of the instructor – "Current instructional practice often finds us in the spotlight, at the center of the action, but our persistent position there compromises the learning potential of students. We need to move to a no less important but much more facilitative role" (Weimer, 2002, p. 94). Examples of changes (Blumberg, 2009):
    - From: Instructor does not align objectives, teaching, learning, assessment methods.
      To: Instructor explicitly, coherently, and consistently aligns methods.
    - From: Instructor uses no activities in which students actively interact with material, instructor, each other.
      To: Instructor routinely uses such materials.
3. The responsibility for learning – "…the locus of the change shifts to action required of students. They must accept the responsibility for learning. This involves developing the intellectual maturity, learning skills, and awareness necessary to function as independent, autonomous learners. The faculty contribution to this process is creating and maintaining conditions that promote student growth and movement toward autonomy" (Weimer, 2002, p. 95). Examples of changes (Blumberg, 2009):
    - From: Instructor does not help students to develop further learning skills.
      To: Instructor facilitates students to develop skills for further learning.
    - From: Instructor believes that instructors alone assess student learning.
      To: Instructor motivates students to assess their own learning.
4. The processes and purposes of assessment – Assessment activities are "used not just to generate grades, but to promote learning as well" (Weimer, 2002, p. 145). Examples of changes (Blumberg, 2009):
    - From: Instructor sees assessment as less important than teaching.
      To: Instructor integrates assessment within the learning process.
    - From: Instructor uses only summative assessment.
      To: Instructor uses formative assessment as well.
5. The balance of power – "In most college classrooms, power, authority, and control remain firmly and almost exclusively in the hands of teachers. It is part of what continues to make instruction very teacher centered and what makes many students disinterested in learning" (Weimer, 2002, p. 45). Examples of changes (Blumberg, 2009):
    - From: Instructor determines course content without seeking feedback.
      To: Instructor determines content and encourages students to explore additional content through projects.
    - From: Instructor mandates all policies and deadlines.
      To: Instructor is more flexible on these.

Daily activities to help promote the five dimensions of learning will be varied, depending on which ones the professor chooses to develop. Listed below are a few examples of specific activities that promote learner-centered teaching.

> Example one: The standard practice now is to distribute teacher-made or computer-generated review sheets the day before each unit test. As part of developing more autonomous learners, students could collaborate in class peer groups to compose five problems and multiple choice answers that they think might be good test questions. The result could be that students might think more reflectively about what topics were learned, analyze which ones were most important, reflect on potential errors as they provide multiple choice answers, and communicate with each other using math terminology. At the end of the group activity, each group would share their questions.
>
> Example two: The standard practice now is for the professor to make all classroom management decisions. Students generally have no say in class policies. While the professor may not feel comfortable with students making decisions, doing so could empower students to take more ownership in the class and in their learning. The professor could do this in incremental steps, either by providing individual options, such as a choice of mediums (poster, scrapbook, oral presentation, PowerPoint, etc.) to use for presentation of a project, or by providing class choices on the first day, such as offering a group choice on the time/day of two of the professor's office hours.

Bridge-Building Sessions

To maintain the focus of improving student learning in MAT 1033 and to acquire additional activity suggestions such as the two listed above, professors teaching MAT 1033 during the term beginning Spring 2011 will meet biweekly at a designated time to share successful strategies, review class assessment data as it becomes available, and receive both technological and pedagogical training as needed. These sessions will be planned through the collaboration of the QEP Director and the District Director of Academic Support Services. Other professors may also attend. Because no new professors will teach the redesigned MAT 1033 course during the summer, there will not be any sessions during the summer. In addition, faculty may review various rubrics and discuss collective progress across the rubrics in each dimension.

Toolboxes

As part of the implementation process, three toolboxes have been created. These are collections of student-engaging classroom activity modules from which instructors can select as they teach Intermediate Algebra classes. The toolboxes contain instructional and pedagogical materials that have been designed to promote learner-centered teaching and to help build a supportive learning environment.

One toolbox contains strategies that aid in the creation of a supportive learning environment in the classroom. Because the tone of a new class is usually set during the first meeting, many of the strategies involve first-class activities which help students become acquainted with each other and with the professor and help the professor become acquainted with the students as well. A sample item from the first toolbox is included in Appendix K.

The second toolbox contains questions for use with student-response systems (clickers) for each student learning outcome in MAT 1033. These will help provide a way to engage the students in the learning process. In addition to engaging students in active, participative learning, clickers provide opportunities for enjoyable, non-threatening formative assessment through students' immediate feedback about content comprehension. As part of in-house professional development, professors will learn a variety of ways to effectively use clickers in class. A sample item from the second toolbox is included in Appendix L.

The third toolbox contains learner-centered activities which involve reflection, collaboration, active learning, and formative classroom assessment techniques. The mathematics professors will continue to add to the toolbox as they move along the continuum toward learner-centered teaching and develop their own activities. A sample item from the toolbox is included in Appendix M.

Although mathematics professors will create the activities, toolbox updating will be coordinated by the QEP Director with the assistance of the mathematics administrative assistant and the QEP administrative assistant.

Learner-Centered Syllabus Workshop

Because the syllabus assists in setting the tone of the class and serves as a vital communication link between the professor and student, a workshop will be held during Fall 2010 to help faculty develop a more learner-centered syllabus. This workshop will be open to all faculty, but its primary focus will be on developing a syllabus for MAT 1033. Each summer, workshops will be conducted to offer a more comprehensive review of various components of a learner-centered syllabus.

At the beginning of each term, all faculty teaching MAT 1033 will send a copy of the course syllabus to the QEP Director. The syllabi will be used to help determine progress toward learner-centered teaching and also support any potential changes to the Basic Course Information (BCI) Sheet (see Appendix N).

Professional Development

As an institution, Polk State College supports professional development. Therefore, in addition to the technological and pedagogical training workshops occurring within the Bridge-Building Sessions, the following opportunities for professional development will be incorporated into the QEP:

National Conferences – Specific conferences have been intentionally targeted for mathematics faculty to attend. The American Mathematical Association of Two-Year Colleges (AMATYC) Conference has been selected because it is the national organization which targets mathematics teaching at two-year colleges. The Teaching Professor Conference has been selected because of its focus on teaching methods, specifically learner-centered teaching. The Learning College Summit Conference has been selected because it spotlights collaboration throughout the entire college network for more holistic learning. At least two mathematics professors will attend each conference each year.

Local Conferences – The Florida Two-Year College Mathematics Association (FTYCMA) Conference and the FTYCMA/Mathematical Association of America (MAA) Joint Conference have been selected as two local conferences for mathematics faculty to attend.

Guest Speakers – Each spring term, a guest speaker will be invited to Polk State College to present a college-wide workshop related to QEP topics. The QEP Director and District Director of Academic Support Services will collaborate to organize the workshops.

In-House Workshops – Technology will be incorporated into the teaching of MAT 1033. Training sessions will be offered on the effective utilization of clickers, sympodiums, and other technologies into the classroom and student learning. There will also be pedagogical workshops on such topics as how to design a learner-centered syllabus.

Lunch and Learn Workshops – Although the focus of the QEP is on Intermediate Algebra, all faculty and staff will support the goals of the QEP and will concurrently benefit from professional development that advances learner-centered teaching and supportive learning environments in their own divisions at the College. Therefore, Lunch and Learn workshops for the professional enrichment of all employees will be offered twice each term on each main campus (Winter Haven and Lakeland). Peer faculty will present QEP-related topics. The Lunch and Learn workshops will be organized by the District Director of Academic Support Services.

College-wide Changes

Support from the Teaching/Learning Computing Center (TLCC)

In addition to a supportive learning environment in the classroom, Intermediate Algebra students will benefit from the quality academic support services of the TLCC tutors. To better coordinate MAT 1033 classroom instruction and mathematics tutoring, the TLCC Director in collaboration with the mathematics faculty will redesign the tutor training. Additionally, mathematics tutors and mathematics faculty will hold a joint meeting once each term to discuss concerns and strengthen the connection between the TLCC and the Mathematics Department so that the students will benefit from the cohesion of a collaborative support system.

Support from the Library

The library will support MAT 1033 students through an accessible catalog with an abundance of mathematics resources available both in-house and online, which will include books, e-books, films, and journal and reference databases. In collaboration with QEP mathematics faculty and tutors, a web-based tutorial guide will be designed specifically for MAT 1033. This guide will aggregate a variety of mathematics resources available on the web and inform students of learning resources available at the College specifically for MAT 1033 students. Library resources will also be deployed to create motivational displays which will highlight the QEP and mathematics and encourage students to succeed in mathematics. The library will also collect and maintain QEP-related professional development resources and instructional support materials, such as films and books for faculty use.

Support from Student Services

The supportive environment will be extended to Student Services as well. Students will benefit from a collaborative effort between faculty, advisors, and counselors. Once each term the Mathematics Department and Student Services will meet so that the mathematics faculty can learn more about Student Services, and the advisors and counselors can learn more about the mathematics program, specifically how MAT 1033 fits into the mathematics program and how it can be in roadblock along a student's academic journey.

Polk State College's student information system, *Genesis*, contains an Early Warning System (EWS) program, whereby a faculty member can notify Student Services of concerns with student attendance and grades (Table 6-2 shows the menu options). Its use will be piloted in the QEP. A faculty member can complete the form online, and it will be forwarded to Student Services for follow-up.

Table 6-2: Early Warning System

#	Student Performance Indicators
01	Student Reported Personal Problem
02	Student Failed To Complete Assignments/Homework
03	Student Has Conduct Issues In Class
04	Not Participating In Class Discussions/Questions
05	Student Is Often Late Or Absent From Class
06	Failing Grades On Assignments And Tests
07	Not Prepared For Class
AB	Frequently Absent From Class
AW	Does Not Complete Assigned Work On Time
CP	Does Not Follow Class Procedures

The EWS will enable faculty members to communicate a student's issues directly to advisors in Student Services so that the student can be supported by both the faculty member and an advisor or counselor. For students to succeed, it is imperative they experience a coordinated, unified, and comprehensive support structure involving all points of contact at the College.

Supportive Learning Spaces

One factor to consider in designing a supportive learning environment is the physical environment, which should be welcoming and functional. The classrooms will be made more appealing through keeping them neat as well as maintaining math-oriented bulletin boards. As the desks in the math classrooms are replaced over time, consideration will be given for purchasing learner-centered workstations. A continuous review of more supportive learning spaces will become a part of the supplementary strategies for the QEP.

College-wide Awareness Activities

4-1-1 Reading Program - Each year the College selects 4 books for employees to read as part of the 4-1-1 Reading Program (a college-wide reading program that promotes reading for all employees – 4 books, 1 college, 1 reading world). The 4-1-1 Committee that selects the books is dedicated to selecting a mathematics book each year as one of the 4 books.

New Student Orientation - At new student orientations, QEP brochures and other QEP informational items will be distributed. Additionally, QEP brochures will be placed in Student Services year round.

Welcome Back Week - During the second week of the Fall and Spring terms, Student Activities sponsors fun, get-acquainted activities for Polk State College students. The QEP will be a highlight of the Welcome Back Week starting with the Fall 2010 and Spring 2011 terms.

First-day Tables - On the first few days of each term, information stations are positioned in several key trafficked areas. QEP-related items will be available at the tables each term beginning in the Spring 2011 term.

Electronic QEP Newsletter - To maintain communication and disperse updated information regarding the QEP, the QEP Director will distribute an electronic newsletter at least once each term.

QEP Website - To communicate to all stakeholders information about current QEP activities and progress of the QEP, regular postings will be made to: www.polk.edu/qep.

Fall Convocation - As part of the rollout, the focus of the 2010 Fall Convocation will be on the QEP. Midway through the implementation period, at the Fall 2013 Convocation, the QEP again will be spotlighted. At the close of the implementation period in 2016, the Convocation will be a reflection on the QEP and the difference it has made at Polk State College.

Poetry Contest - To aid in mathematics awareness and awareness of the QEP, the English Department will sponsor a contest for students to write QEP-related poems. The poetry contest will take place during the Fall 2010 term. Additional contests sponsored by a variety of departments will be held as the implementation of the QEP progresses.

Theatre Productions - To aid in mathematics awareness, Polk State College's Theatre Department plans to incorporate several mathematics-related plays during the implementation process. The first play, *Proof*, will be produced in September 2010.

Implementation Logistics

To allow time for faculty members to incorporate the new paradigm, teaching strategies, curricular adjustments, and begin implementing the toolboxes, the MAT 1033 classes will be capped at a lower number of students during the first semesters of the QEP implementation. During and after this adjustment period, the relative success of the implementation will be evaluated, and dependent upon the findings, an incremental increase in the caps for these classes will be determined in an effort to arrive at an optimal class size. The effect of class size on success will be evaluated throughout the duration of the QEP. Because of lowering the cap, additional sections of the course will be needed. An estimate of the cost for the additional sections has been included in the budget.

Due to the extra time involved for the Bridge-Building Sessions, full- and part-time faculty members teaching MAT 1033 and attending the biweekly sharing will receive a stipend of $825 each term they teach MAT 1033. Because these sessions will not be conducted in the summer, there will not be a stipend in the summer.

Chapter 7: Timeline

Presented below is a summary of the implementation of the main activities described in detail in Chapter 6.

Pilot Implementation 2010-2011

Fall:
- QEP awareness rollout at Fall Convocation.
- Initial training of mathematics faculty.
- Pilot toolbox materials in two classes.
- Lunch and Learn series begins and continues every fall and spring.
- Professional development begins: in-house, local and national conferences.
- Library purchases QEP materials, creates library guides, and designs displays.
- Joint meetings take place (Student Services and Mathematics Department; TLCC and Mathematics Department). These continue every fall and spring.
- Early Warning System logistics are reviewed.
- Various college-wide activities to support QEP begin.
- Electronic QEP newsletter is issued.

Spring:
- 30% of classes begin learner-centered teaching.
- Bridge-Building Sessions begin and continue every fall and spring.
- Professional development begins: guest speaker, local and national conferences.
- Early Warning System is implemented.
- Redesigned tutor training begins.
- Library maintains displays and updates QEP-related resources.

Summer:
- Review and evaluation of first year of QEP commences.
- Learner-centered teaching training continues each summer.

QEP Rollout Phase 2011-2012

The percentage of classes scheduled for learner-centered teaching in the fall increases to 45%, and part-time and online classes are added. In the spring term, 60% of the classes will be scheduled for learner-centered teaching. All other activities continue.

QEP Rollout Phase 2012-2013

The percentage of classes scheduled for learner-centered teaching in the fall increases to 75% and will remain at least 75% for the duration of the implementation. All other activities continue.

QEP Rollout – Remainder of Implementation

Same as the previous years; maintaining an implementation of at least 75%.

The timeline on the following two pages (Table 7-1: Implementation Activities and Timeline) shows the QEP implementation detail associated with six academic years from plan development and pilot implementation (2010-2011) to compilation of the 5-year report for review by SACS-COC (Fall 2016). The legend in the shaded upper-left portion of the table header provides the key to activity codes used to depict the character of the activities scheduled across the term sequence of each academic year (AY).

Table 7-1: QEP Implementation Activities and Timeline

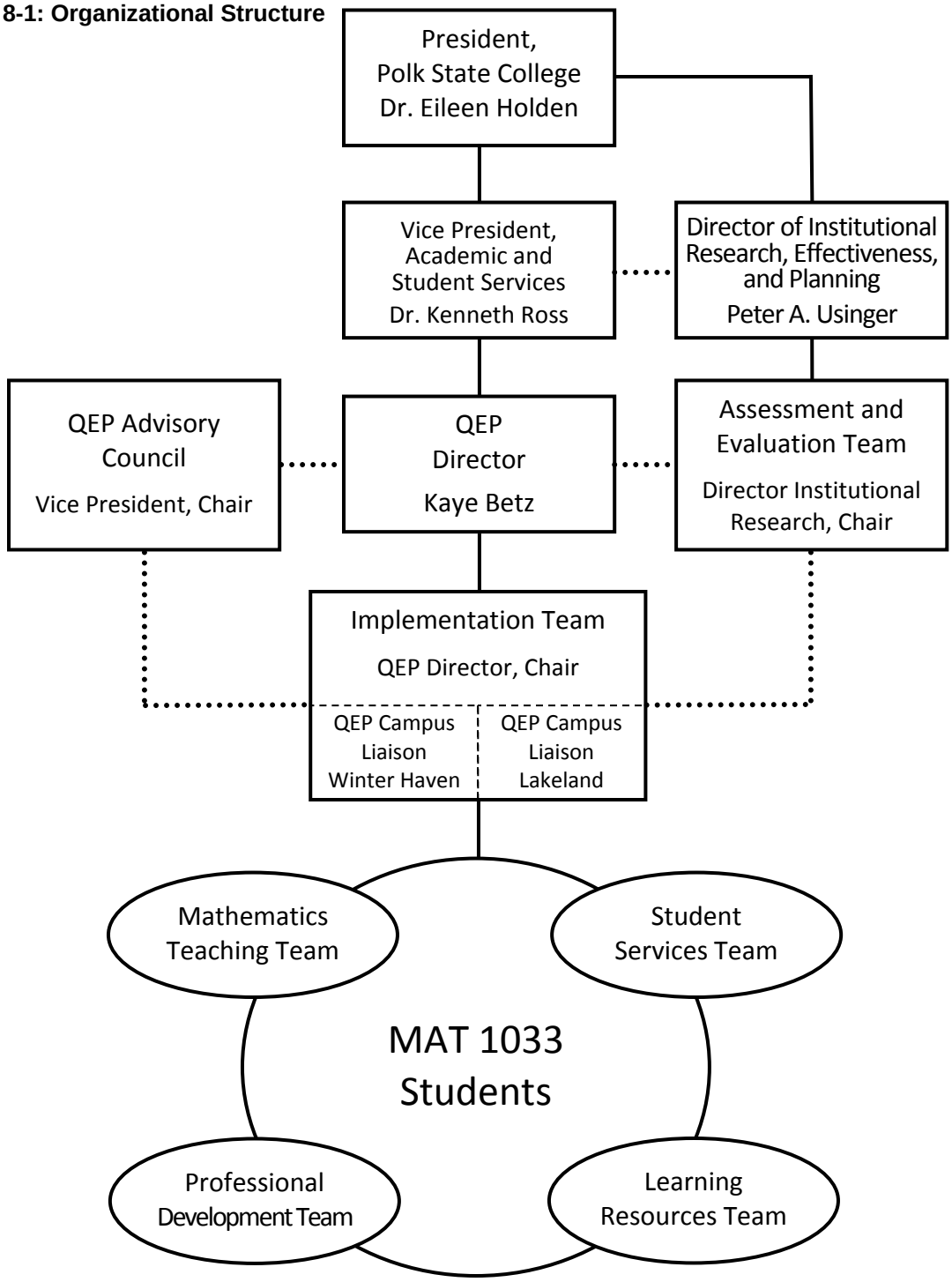
Description		Summer 2010	AY 2010/11			AY 2011/12			AY 2012/13			AY 2013/14			AY 2014/15			AY 2015/16			Fall 2016
Legend: A=As Needed; C=Create; R=Review; U=Update; X=Execute			Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer	
MAT 1033 Instruction	Estimated Number of Sections	0	2	12	5	22	25	10	37	31	12	37	31	12	37	31	12	37	31	12	TBD
	Estimated Number of Students	0	44	264	110	484	550	220	814	682	264	814	682	264	814	682	264	814	682	264	TBD
	Full-Time Faculty Involved	0	2	8	TBD	10	10	TBD	12	12	TBD	14	14	TBD	16	16	TBD	18	18	TBD	TBD
	Part-Time Faculty Involved	0	0	0	TBD	2	2	TBD	4	4	TBD	6	6	TBD	6	6	TBD	6	6	TBD	TBD
Align Final Exam to Course Objectives		X	-	-	-	-	-	-	-	-	-	R	-	-	-	-	-	-	-	-	-
Prepare for Fall Convocation on QEP		X	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	X	-
Focus Fall Convocation on QEP		-	X	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	X
Faculty/Program Director Workshop		-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Libraries and TLCC	Acquire QEP-relevant resources	X	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	TBD
	TLCC Math Tutor Training	-	R	X	-	X	X	-	X	X	-	X	X	-	X	X	-	X	X	-	TBD
	QEP-focused Displays	-	C	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	TBD
	Library Class Guide for MAT 1033	-	C	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	TBD
Professional Development	The Teaching Professor Conference	X	-	-	X	-	-	X	-	-	X	-	-	X	-	-	X	-	-	X	-
	The Learning College Summit Conf.	X	-	-	X	-	-	X	-	-	X	-	-	X	-	-	X	-	-	X	-
	Rubric Discussion Videoconference	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Learner-centered Rubric Workshop	-	X	-	X	-	-	X	-	-	X	-	-	X	-	-	X	-	-	X	-
	AMATYC Conference	-	X	-	-	X	-	-	X	-	-	X	-	-	X	-	-	X	-	-	TBD
	FTYCMA Conference	-	X	-	-	X	-	-	X	-	-	X	-	-	X	-	-	X	-	-	TBD
	Learner-centered Syllabi Development	-	X	-	R	-	-	R	-	-	R	-	-	R	-	-	R	-	-	R	-
	College-wide Lunch and Learn Series	-	X	X	-	X	X	-	X	X	-	X	X	-	X	X	-	X	X	-	TBD
	Instructional technology workshops	-	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	TBD
	Bridge-Building Sessions	-	-	X	-	X	X	-	X	X	-	X	X	-	X	X	-	X	X	-	TBD
	Learner-centered Pedagogy Workshop	-	-	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	TBD
	MAA/FTYCMA joint meeting	-	-	X	-	-	X	-	-	X	-	-	X	-	-	X	-	-	X	-	-
	College-wide QEP Topics Workshop	-	-	X	-	-	X	-	-	X	-	-	X	-	-	X	-	-	X	-	-

Description		Summer 2010	AY 2010/11			AY 2011/12			AY 2012/13			AY 2013/14			AY 2014/15			AY 2015/16			Fall 2016
Legend: A=As Needed; C=Create; R=Review; U=Update; X=Execute			Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer	
Review and Apply Prior Term's Assessments		-	-	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Toolboxes	First day strategies	C	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	TBD
	Clicker questions	C	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	TBD
	Learner-centered math activities	C	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	TBD
Math Faculty	Submit *Documentation to Support the Selected Status* forms to QEP Director	-	X	-	X	-	-	X	-	-	X	-	-	X	-	-	X	-	-	X	-
	Submit Syllabus for MAT 1033 course to QEP Director	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-
	Submit *Planning for Transformation* exercise to QEP Director	-	X	-	X	-	-	X	-	-	X	-	-	X	-	-	X	-	-	X	-
College-wide Activities	QEP Materials Disseminated at New Student Orientation	-	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	TBD
	QEP Materials disseminated at Student Information Tables	-	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	TBD
	QEP Materials Disseminated at Welcome Back Week	-	X	X	-	X	X	-	X	X	-	X	X	-	X	X	-	X	X	-	TBD
	Electronic QEP Newsletter	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	TBD
	Poetry Contest	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Performance of the Play *Proof*	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4-1-1 Reading Program (Math Book)	-	X	-	-	X	-	-	X	-	-	X	-	-	X	-	-	X	-	-	TBD
Joint Student Services/math faculty meeting		-	X	X	-	X	X	-	X	X	-	X	X	-	X	X	-	X	X	-	TBD
Joint TLCC tutors/math faculty meeting		-	X	X	-	X	X	-	X	X	-	X	X	-	X	X	-	X	X	-	TBD
Professional Development Committee		-	C	X	-	X	X	-	X	X	-	X	X	-	X	X	-	X	X	-	TBD
QEP Advisory Committee		-	C	X	-	X	X	-	X	X	-	X	X	-	X	X	-	X	X	-	TBD
Apply Early Warning System for MAT 1033		-	R	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	TBD
Publish Annual QEP Summary Report		-	-	-	-	X	-	-	X	-	-	X	-	-	X	-	-	X	-	-	X
Com. Coll. Survey of Student Engagement		-	R	-	-	-	-	-	-	X	-	R	-	-	-	-	-	-	X	-	R
MAT 1033 Report as part of 5-year Review		-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	X

Chapter 8: Organizational Structure

As the College moves from planning and development to implementation, Figure 8-1 illustrates the proposed relationships among the various organizational components responsible for the implementation of the QEP. In this structural representation, solid lines indicate functional relationships while dashed lines represent collaborative relationships. The various components of this structure are explained in more detail on the following pages.

Figure 8-1: Organizational Structure



Roles and Responsibilities

The following summary explains the proposed roles of the positions, advisory council, and teams responsible for the various tasks associated with the implementation of the QEP.

Vice President for Academic and Student Services

Reporting directly to the President, the Vice President for Academic and Student Services will provide oversight for the implementation and evaluation of the Quality Enhancement Plan by working closely with the Director of Institutional Research, Effectiveness, and Planning and the QEP Director, and by chairing the QEP Advisory Committee.

QEP Director

Reporting to the Vice President for Academic and Student Services, the QEP Director will be responsible for the management and execution of the QEP, including the allocation of project resources. The Director will lead the QEP Implementation Team, direct all activities associated with the QEP, prepare all project reports and materials, monitor the project budget, communicate the status of the QEP implementation via an electronic college-wide newsletter, and facilitate the annual evaluation of the project.

Implementation Team

The Implementation Team will consist of the chairs of the Mathematics Teaching Team, the Student Services Team, the Learning Resources Team, and the Professional Development Team, as well as one academic dean, and one representative from each: the Workforce Education Quality Council (WEQC), the Business Office, the Facilities Department, the student body, the Lakeland faculty (campus liaison), and the Winter Haven faculty (campus liaison). The Implementation Team along with other members of the various teams will carry out the implementation activities of the QEP, providing recommendations as needed. Under the QEP Director's leadership, each campus liaison will assist with implementation tasks on his or her respective campus, in particular where a specific team is not already assigned.

QEP Advisory Council

The QEP Advisory Council will provide input, guidance, and feedback regarding the implementation and evaluation of the QEP. Further, it will assist the College in promoting community awareness of the QEP and will serve as liaison between the community and the College. A key responsibility of the QEP Advisory Council will be to review and address expectations that appear either too high or too low based upon the assessment. Membership on the Council will include Polk State College faculty, staff, community members, and student representatives.

Director of Institutional Research, Effectiveness, and Planning

The Director of Institutional Research, Effectiveness, and Planning will lead the Assessment and Evaluation Team and the statistical analyses of all QEP related data, will provide annual QEP evaluation updates, and will communicate assessment issues with the QEP Director, the QEP Advisory Council, and other institutional audiences. The director will provide assessment oversight of the Quality Enhancement Plan and will ensure its coordination with the overarching college planning and institutional effectiveness processes. The Director reports directly to the President and serves as the college's SACS liaison.

Assessment and Evaluation Team

The Assessment and Evaluation Team will provide assessment support, evaluation resource management, data analysis and information required for the evaluation, and further development and implementation of the QEP project. This team will review all facets of the QEP assessment data and provide assessment summary reports and comparative evaluations. Membership will include the college's Research and Reports Coordinator, the Mathematics Department's Assessment Coordinators, and one representative each from the Institutional Effectiveness Council and the Planning and Budget Council. The Research and Reports Coordinator will be in charge of providing ongoing assessment support concerning all QEP-relevant inquiries.

Mathematics Teaching Team

The Mathematics Teaching Team will provide support and guidance to other mathematics faculty members for the purpose of redesigning courses and promoting learner-centered teaching in a collaborative classroom atmosphere. Membership will include primarily MAT 1033 faculty but is open to all Polk State College faculty and students as well. The team will select Co-chairs.

Professional Development Team

The Professional Development Team is responsible for offering learner-centered professional development activities. With the assistance of college staff, a group of faculty will facilitate workshops and other training sessions. In particular, inter-departmental collaboration opportunities emphasizing the relevance of mathematics to other disciplines, careers, and life experiences will be encouraged. Membership will include the District Director for Academic Support Services (chair), faculty representation from both campuses, a representative from the college's Staff and Program Development Committee, and representation from the WEQC.

Student Services Team

The Student Services Team will be responsible for the development and facilitation of programs, activities, and services that will support the QEP, particularly the utilization of the Early Warning System. Membership will include the Deans of Student Services (Co-chairs) plus advisors and academic success counselors from both campuses.

Learning Resources Team

The Learning Resources Team will be responsible for the development of auxiliary services to support MAT 1033, including the improvement and integration of individual and group tutoring, development of new tutoring materials and student workbooks, utilization of films on demand, development of new testing strategies, and the redevelopment of testing facilities. Membership will include the Directors of Learning Resources (Co-chairs), library and TLCC staff, tutors, and student representatives from both campuses.

It is expected that all committees and teams meet at least once per term, provide meeting minutes to the College, and provide a summary of their activities and decisions as part of the annual QEP update report.

Chapter 9: Resources

The QEP Committee recognizes that implementing Math: The Bridge to Success requires a resolute commitment of physical, human, and financial resources. All expenditures are covered from the reallocation of existing institutional resources. Personnel, implementation costs, professional development, and assessment-instrument expenses comprise a major portion of the budget. Through the use of existing classrooms, tutoring labs, computer labs, and office space, no additional physical resources are required for the project.

Implementing the plan will require a significant commitment in personnel. Salaries and benefits for the QEP's administrative team are included in the six-year QEP budget and cover administrative and support personnel. Supporting resources for faculty and staff professional development are also reflected in the six-year budget, including in-state and out-of-state travel to conferences, costs for guest speakers, and costs for the Lunch and Learn workshop series.

Not reflected in the six-year QEP budget are the direct costs for management and administrative support, college support for students participating in QEP selected courses includes costs attributable to academic and student support such as academic advising, libraries, student computer labs and tutoring services. It is expected that this additional workload for supporting the QEP is 6.8%. Based upon the current allocations to academic and student support this amounts to approximately $19,500 per year which will be covered using existing resources and are embedded in the respective departmental budgets.

As part of the implementation plan, the class size for the redesigned MAT 1033 classes will be 22 students per class at the beginning and will be reviewed each year to determine if it should be raised or kept at 22. When the classes are capped at 22 (the normal cap is 30), additional sections will be needed to provide seats for the 8 students that are displaced by reducing the cap from 30 to 22. In calculating the number of extra sections required and the cost of running the extra sections, a cap of 22 students for the entire duration of the implementation will be used.

Table 9-1 on the following page displays the college's commitment in financial, human, and physical resources for successful implementation of the QEP. The following paragraphs provide the rationale for the projected costs.

Projected Implementation Cost Detail

1. **Faculty Development: In-House Workshops.** The District Director of Academic Support Services will organize a variety of on-campus workshops beginning with the Fall 2010 Convocation for a cost of $1,200. Four (4) Lunch and Learn workshops will be conducted each fall and spring term and made available to all faculty. The cost of these workshops will be (4 X $200) x 2 = $1,600. During the spring term each year, a guest-speaker presenting learner-centered pedagogy will be made available for all faculty at a cost of $2,500. Thus, the total expenditure for faculty workshops per year is $5,300. The six-year total cost will be $31,800.
2. **Faculty Development: Local Conferences.** Four (4) mathematics faculty will attend the Florida Two-Year College Mathematics Association (FTYCMA) conference each year for six years, beginning with the 2010-11 academic year at $400 per person, for a yearly total of

Table 9-1: QEP Budget Overview

Activity		Summer 2010	Academic Year (AY) Fall, Spring, Summer						Total
			2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	
1.	Faculty development: In-House workshops	$0	$5,300	$5,300	$5,300	$5,300	$5,300	$5,300	$31,800
2.	Faculty development: Local Conferences	$0	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$14,400
3.	Faculty development: National Conferences	$6,000	$9,000	$9,000	$9,000	$9,000	$9,000	$9,000	$60,000
4.	Faculty/staff: in-district and out-of-district travel	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$10,500
5.	Stipend for mathematics faculty	$0	$6,600	$19,800	$26,400	$33,000	$36,300	$39,600	$161,700
6.	Staff supplemental sections	$0	$11,550	$26,400	$37,950	$37,950	$37,950	$37,950	$189,750
7.	Student assessments and surveys	$0	$1,000	$1,000	$7,400	$1,000	$1,000	$7,400	$18,800
8.	Consultants	$3,000	$5,000	$2,500	$2,500	$2,500	$2,500	$2,500	$20,500
9.	Professional organization membership	$0	$500	$500	$500	$500	$500	$500	$3,000
10.	Instructional technology	$0	$3,200	$3,200	$3,200	$3,200	$3,200	$3,200	$19,200
11.	Workshop materials	$500	$2,000	$4,000	$3,000	$2,000	$1,000	$1,000	$13,500
12.	Management and administrative staff	$24,067	$96,266	$96,266	$96,266	$96,266	$96,266	$96,266	$601,663
13.	Printing, office supplies, and postage	$500	$750	$750	$750	$750	$750	$750	$5,000
14.	College community awareness program	$67,855	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$79,855
15.	New facilities, remodeling, renovation	Future Capital Improvement Program (CIP) and Public Capital Outlay (PECO) funding requests – See projected implementation cost detail for #15.							
TOTALS		$103,422	$147,066	$174,616	$198,166	$197,366	$199,666	$209,366	**$1,229,668**

$1,600. Expenses include registration fees and overnight accommodations. Beginning with the 2010-11 academic year, two (2) mathematics faculty will attend the joint session of the FTYCMA and Mathematical Association of America each year at a cost of $400 per person for a yearly total of $800. The six-year total cost of attending local conferences will be $14,400.

3. **Faculty Development: National Conferences.** Each year, three national mathematics conferences will be attended by two (2) mathematics faculty each. The three conferences are the American Mathematical Association of Two-Year Colleges (AMATYC) conference, the Teaching Professor conference, and the Learning College Summit. Expenses include registration, overnight accommodations, meals, and transportation at a cost of $1,500 per person for each conference, totaling $9,000 each year, for a six-year total cost of $60,000 which includes $6,000 for travel in the development summer of 2010.

4. **Faculty/Staff: In-district and out-of-district travel.** Mileage expenses associated with travel to and from meetings, conferences, or workshops during the QEP period will be at the State of Florida-mandated rate of $0.445 per mile. This includes travel between campuses.

5. **Stipends for math faculty.** Mathematics professors, both full- and part-time, who teach at least one class of the redesigned MAT 1033 during a term will receive a stipend of $825 for the term. This will compensate for the extra time the Bridge-Building Sessions will involve. Because the number of professors teaching the redesigned course will increase over time, the number of stipends will increase as well. The total of 196 stipends at $825 each will be $161,700. The numbers of stipends for each academic year are as follows:

Academic Year	Fall Stipends	Spring Stipends	Total Stipends
2010-2011	0	8	8
2011-2012	12	12	24
2012-2013	16	16	32
2013-2014	20	20	40
2014-2015	22	22	44
2015-2016	24	24	48
Totals	94	102	196

6. **Staff supplemental sections.** Due to lowering the cap of the redesigned MAT 1033 classes, additional sections will be required beginning fall 2010. Because faculty are paid at a rate of $1,650 for an overload class, that is the rate which will be used to calculate the cost of the additional sections. AY 2010-2011: 7 additional sections, AY 2011-2012: 16 additional sections, AY 2012-2013: 23 additional sections, AY 2013-2014: 23 additional sections, AY 2014-2015: 23 additional sections, AY 2015-2016: 23 additional sections. The total number of additional sections for six years will be 115 at $1,650 each, which will total $189,750.

7. **Assessment.** In spring 2010, the college's Department of Institutional Research, Effectiveness, and Planning (IREP) conducted the *Community College Survey of Student Engagement* (CCSSE), which provided vital information for implementation. In 2013 and 2016, the CCSSE again will be administered to compare benchmark results and gauge instructional effectiveness. Provisions have been made for employing a series of survey instruments throughout the evaluation period to refine the implementation plan and its

outcomes and impact. The cost beginning 2010-11 includes $1,000 each year plus $6,400 for each administration of CCSSE. The six-year total cost will be $18,800.

8. **Consultants.** In fall 2010, Dr. Phyllis Blumberg, a l expert, will conduct an initial training session with the mathematics faculty. Yearly follow-up workshops will be conducted each summer for the duration of the implementation period. At $2,500 for each workshop, with two being conducted in the 2010-2011 academic year, the consultant cost will total $20,500. This cost includes a fee of $3,000 paid to a separate consultant for assistance with the development of the QEP.
9. **Professional organization membership.** Institutional membership in the American Mathematical Association of Two-Year Colleges (AMATYC) commences with the 2010-11 academic year in the amount of $500. The six-year total cost will be $3,000.
10. **Instructional Technology.** Instructional technologies will be phased in over a six-year period to supplement the development of instructional methods, enhance teaching styles, and support tutoring sessions. Due to the continuously changing nature of these technologies, an estimate of $3,200 per year has been applied. The six-year total cost will be $19,200.
11. **Workshop materials.** The six-year total cost for supplies to supplement the various developmental workshops during the implementation of the QEP will be $13,500.
12. **Management and administrative support staff.** The QEP administrative team will consist of one (1) QEP Director at 100% time and two (2) support personnel at 25% time each throughout the preparation and six-year implementation of the QEP. The total salary and benefits will be $601,663.
13. **Printing, office supplies, and postage.** Printing, paper, postage, office supplies and other supplies will be needed to support the implementation of the QEP. Six-year total cost will be $5,000.
14. **College-wide awareness activities.** Marketing and advertising of the QEP and the chosen topic to the college and the community at large will utilize a variety of media, such as banners, printed materials, and other on-campus promotions. Additional incentives will be developed and circulated to achieve maximum college-wide awareness and engagement throughout the six-year QEP implementation period. The six-year total cost will be $79,855.
15. **New facilities, remodeling, and renovation.** All new construction, remodeling, and renovation projects will consider the needs and lessons learned from the QEP for mathematical-support laboratories and classrooms. These considerations will be part of future Capital Improvement Program (CIP) and Public Capital Outlay (PECO) funding requests to the State of Florida, State Board of Education for four- and two-year institutions.

In addition to this ongoing commitment, the implementation of the QEP is a standing priority item in the College's Strategic Planning process through which any identified needs for additional resources both from the management and administrative support team, the faculty and College support departments would be identified and addressed through either allocation of additional resources or reprioritization of existing resources.

Chapter 10: Assessment

As indicated earlier, Polk State College's Quality Enhancement Plan, Math: The Bridge to Success, aims to improve student learning in Intermediate Algebra (MAT 1033) through learner-centered teaching and a supportive learning environment. The underlying assumption is that these strategic changes will help students to be more successful in Intermediate Algebra and, as a result, they will more readily progress toward further academic success and/or future career goals.

To verify this assumption, the evaluation of all goals and student learning outcomes of the QEP is governed by a detailed and comprehensive assessment plan that covers a wide array of events, behaviors, perceptions, and performance data. The elements of this assessment plan are designed to monitor all major changes throughout the course of the QEP implementation, ranging from student experiences during the first days of class to subsequent performance measures and graduation rates.

Any measures to assess MAT 1033-based changes in knowledge, skills, attitudes, or behaviors are designed to evaluate the QEP's achievement of its four overarching student learning outcomes (SLO), which are expressed in the following fundamental expectations:

- Students will demonstrate competence in MAT 1033 learning outcomes.
- Students will successfully complete MAT 1033 on the first attempt.
- Students passing MAT 1033 will be successful in the subsequent mathematics course.
- Students successfully completing MAT 1033 will graduate in their selected degree program.

In practice, the College aims to accomplish these results by carrying out a variety of change initiatives that are governed by the QEP's implementation goals described earlier in Chapter 4. To reiterate, these implementation goals are:

Goal 1: Student learning in Intermediate Algebra (MAT 1033) will improve.

Goal 2: The learning environment for Intermediate Algebra students will be supportive.

The combined assessment of both overarching student learning outcomes and governing implementation goals – some of which are further disaggregated into subsets of goal-specific objectives – is accomplished by measuring the differential learning outcomes shown in Table 10-1 at the end of this chapter.

Each set of expected outcomes is strongly aligned with the college's commitment "to student learning and achievement through the consistent practice of collaboration and focus on excellence," as expressed in Polk State College's mission. Furthermore, the college's 2007-2012 Strategic Plan states the strategic imperative that "all administrative and educational decisions will be learning-centered and student-centered and will be guided by our Core Values." Because this aim is emphasized by the focus of two of Polk State College's core objectives: increasing student retention and enhancing student success, it is self-evident that the ultimate accomplishments of the QEP must be evaluated in exactly those terms.

General Assessment Design

The QEP assessment design is fully integrated with the college's Educational Program Assessment (EPA) model and the assessment and accountability targets defined by the Key Performance Indicator (KPI) metrics of the college's strategic plan. The multi-dimensional EPA model uses numerous sources of data generated by various methods of analysis to evaluate the degree to which desired outcomes have been achieved. For each component of the model, Polk State College creates and reviews area-specific assessment and institutional effectiveness reports that combine into the annual Institutional Effectiveness (IE) reporting of the College.

The results of all QEP-related measures will be aggregated into an additional QEP-specific IE report module, displaying the following key areas of evaluation:

- Direct outcomes assessment of course-specific student learning outcomes via standard departmental tests, administered to students at the end of each term.
- Assessment support measures that capture student pass rates in MAT 1033 and subsequent student success, specifically across math and science courses annually.
- Comparative assessment data that will track MAT 1033 success rates and goal attainment in ranking and percentage points across the Florida College System.
- Student perceptions of instruction, educational support areas, and the college environment as a whole via combinations of end-of-term and annual student surveys.
- Faculty perceptions of classroom instruction and activities as expressed in the results of instructor self-assessments using learner-centered teaching rubrics.
- Gap analysis between student's course performance, student perceptions, and instructor self-assessments to inform the continuous development process.
- Auxiliary faculty engagement measures are compiled to track meeting, workshop, and conference participation of instructors across a variety of settings.

All assessment data will be available in term-by-term comparisons (where applicable) and annual summaries in order to document the relationships between and impact of all major QEP activities associated with each QEP objective. A more detailed overview of each of the main assessment components is provided in the following paragraphs, while Table 10-1 at the end of this chapter provides a summary of all QEP assessment measures.

Departmental Exams

The same mathematics departmental final exams will be used across all MAT 1033 sections to assess if students demonstrate the desired mathematical skills and competencies. The exam consists of 25 questions in multiple-choice format on four different forms, and students have 75 minutes to complete the test using Scantron sheets. Student scores are computed based on the total number of correctly answered items on the exam. Additional assessment is conducted to identify the proportion of students achieving the desired outcome for each targeted course SLO. (See Table 4-1 for the SLO expectations; examples of the final exam questions will be provided to Reaffirmation Committee upon request.)

Each instructor will receive a packet of testing materials, administer the test to all MAT 1033 students, and submit the completed Scantron sheets to the departmental assessment coordinator (AC) for processing. The AC will forward the resulting data to the Office of

Institutional Research, Effectiveness, and Planning for further evaluation and compilation of the QEP-specific outcomes. All final exam questions represent one of the five learning outcomes for QEP-objective 1.1 (see Chapter 4) and will be aggregated in the following fashion:

- SLO #1: Solve and graph systems of equations and inequalities (5 questions).
- SLO #2: Perform basic operations with functions (2 questions).
- SLO #3: Factor polynomials and solve quadratic equations (5 questions).
- SLO #4: Simplify and solve rational expressions and equations (6 questions).
- SLO #5: Simplify expressions involving fractional exponents or radicals (7 questions).

Finally, question-specific results from the final exam that correlate to the each of the five student learning outcomes as indicated above will be tabulated to document the percentage of students that correctly answered questions pertaining to each student learning outcome of the QEP. Results will include an analysis of instructor- and item-specific variances and correlations of performance data with student perceptions and faculty self-evaluations.

Assessment outcomes will also be compared with historic course assessment data and with outcomes of classes not part of the QEP implementation. The Office of Institutional Research, Effectiveness, and Planning will document the student learning outcomes at the end of fall and spring terms and share the results with the mathematics assessment coordinator, mathematics faculty, the QEP Director, the QEP Implementation Team, the QEP Advisory Council, and publish them to the QEP intranet website.

Faculty Self-Assessment

The learner-centered teaching model to be implemented throughout the course of Polk State College's QEP focuses on Weimer's (2002) five instructional practice areas to achieve learner-centered teaching:

1. Function of Content
2. Role of the Instructor
3. Responsibility for Learning
4. Processes and Purposes of Assessment
5. Balance of Power

To assist faculty with the implementation of these distinct but otherwise very broad categories, rubrics were developed that disaggregated each practice area into specific and tangible components of stepwise instructional and behavioral change, following Blumberg's (2006) recommendations: "Incremental steps allow instructors to make changes gradually over time. These incremental steps define a manageable transition process from instructor-centered to learner-centered teaching."

Blumberg (2006) translated these incremental steps into self-evaluation rubrics that faculty can use to assess their own progress. The rubrics provide a formidable tool for faculty to not only assess their own instructional development, but to correlate and compare their self-ratings with student perceptions and success. The main benefit of rubrics lies in their flexibility to describe incremental change levels across a variety of practice areas, or as Blumberg states:

Instructors can see incremental steps, given on the rubrics, in the transformation process toward learner-centered teaching. This tool explains various ways to change an instructor's teaching. Specific courses may be at different points in their transition to learner-centered teaching as indicated by different levels on the components of the rubrics.

In addition to and combined with the self-assessment rubrics, all involved faculty members will also complete a detailed action review sheet to indicate the presence and frequency of the specific learner-centered instructional activities applied throughout each course. These checklists (which reflect the 29 Learner-Centered Components listed in Appendix G) will be developed during the initial faculty training and used (in conjunction with the self-assessment rubrics) to identify the impact of these activities on student learning outcomes, while helping to determine which learner-centered teaching approaches are successful.

As part of the first year review, a gap analysis between student learning and performance outcomes compared to professors' self-evaluation using the rubrics and the checklists will be conducted to determine the need for additional peer-to-peer review measures. The analysis will specifically look at student data in correlation with the level of implementation of learner-centered teaching approaches in order to determine the effects of QEP-specific instructional components. As such, it is also designed to inform the continual faculty development process as well as the effectiveness of selected classroom strategies.

In addition, the College will collect existing syllabi from all MAT 1033 faculty to establish a baseline measure for the syllabi content as part of the learner-centered syllabi development. The collection of syllabi will continue each semester for both the QEP sections and the non-QEP sections to support the annual syllabi review during the summer term. Observed changes in syllabi are expected to involve more learner-centered approaches as evidence of a change pedagogy and will be included in the annual QEP analysis. Over time, and with continual increase in faculty participation in the QEP rollout, these changes will eventually lead to modifications of the underlying Basic Course Information (BCI) content (Appendix N) as well.

Student Perception of Instruction (SPI)

While course examination scores, as reflected in the results of the final departmental tests described above, are the primary criteria for determining student achievement of the desired learning outcomes of the course, these scores reflect only a partial view of the SLO spectrum covered by this QEP. Another key element of the assessment toolset is student evaluation of the course. At Polk State College, faculty administer a Student Perception of Instruction survey that students complete at the end of the term.

The Student Perception of Instruction (SPI) survey provides students the opportunity to express anonymously their views about the professor's classroom management and communication skills, the way the class was taught, course materials, and other experiences within the class. The standard SPI form contains 17 questions with Likert- response formats and four questions in open-ended response format. For the purpose of the QEP, this instrument will be expanded to capture perceptions about specific learner-centered activities during class and selected educational support services offered by the College.

The current SPI tool has been in place for more than 5 years, and results for most of course sections have been entered into the college's student database since the implementation of the new administrative system in 2006. Based on the longitudinal data available and the continuous use of the instrument across Polk State College classes, this supplementary assessment information should be able to provide substantial insights into shifts in students' experiences and perceptions as a result of more learner-centered instructional and support environments.

Student Perception Surveys

To cover the less course-specific experiences of MAT 1033 students, they will receive an invitation to participate in Polk State College's QEP survey at the end of each term. This survey will consist of about 30-40 questions – the majority in a Likert-scale multiple-choice format – aiming to capture more overarching student perceptions of educational and administrative support services, specifically focusing on the TLCC, library, student services, faculty-student interaction, and general college environment-related student feedback. Favorable responses across the SPI and the QEP survey instruments will be typically associated with the top two ratings of the five-point Likert scale used.

The QEP survey will be administered online, with links provided via e-mail to all students enrolled in the course. The survey will also contain a small subset of control questions, which are original parts of the expanded SPI forms, to ensure instrument reliability and to check for validity constraints. This level of redundancy will allow for potential scale or item calibrations and weighting of survey responses across certain core measures of both toolsets to address possible self-selection bias and other measurement- and administration-related variances. The survey will contain a student identifier to ensure that relevant performance factors can be correlated and subsequent course performance is traceable.

In addition, Polk State College's Information Technology Department is currently working on implementing an automated exit survey for students who chose to withdraw from MAT 1033. While this survey will cover a smaller subset of the SPI and QEP survey items, it will ask students for their withdrawal reasons and suggestions to improve a potential re-enrollment experience.

Academic Success Data

Falling under the category of assessment support measures, the academic success data for MAT 1033 students will cover a variety of student achievement data and their accompanying factors. Two sources of information are used to provide accurate and up-to-date measurement information: (1) the college's Student Database (SDB) that contains all the demographic, enrollment, and achievement data, which is submitted both by term and annually to the state; and (2) special extracts of information from the college's administrative system, which contain additional data not available via the standard SDB submission.

This academic-success data will provide not only the information necessary to track student performance in MAT 1033 and other courses in which a student is concurrently enrolled, but also it will allow for longitudinal tracking of preceding and subsequent academic success across all of a student's program areas. Together with the demographic information and the

various measures contained in the QEP survey, this data will allow the College to develop and test sets of multivariate success and retention models that are able to inform the overall implementation and success evaluation of the QEP.

To ensure relative anonymity when correlating student performance and perceptions, the college's Office of Institutional Research, Effectiveness, and Planning will merge the raw data using randomly-selected access codes provided for the survey portions of the assessment and delete personal information from the analytical dataset after the data has been merged. The dataset will not be available to faculty in order to preserve student anonymity, and the resulting reports will only summarize group or cohort data.

Using the college's SAS® software licenses for statistical analysis (*SAS 9.2*) and predictive modeling (*Enterprise Miner 6.1*), the Office for Institutional Research, Effectiveness, and Planning will manage all datasets; execute the various descriptive and inferential statistics; and conduct the annual tracking tasks, including the evaluation and calibration of multivariate student performance and success models. The results of these analyses will be provided annually as part of the QEP portion of the college's *Institutional Effectiveness Report*; some data summaries will be published each term as part of the departmental QEP reporting.

Accountability Benchmarks

Florida statutes direct the State Board of Education to provide for the systematic, ongoing improvement and assessment of the improvement of the quality and efficiency of the Florida College System (FCS). Being able to compare state-level results for The FCS's lower-division accountability measures over a five-year period allows Polk State College to compare the results of internal improvements as expressed by the accountability indicators for the system as a whole, and/or with selected peers within the system.

The accountability measures fall into five areas: (1) Retention and Success Rates; (2) Performance of Associate of Arts (AA) Transfer Students in the State University System (SUS); (3) Placement of Vocational Program Completers; (4) Success Rates of Students in College Preparatory Reading, Writing, and Mathematics; and (5) Student Performance in the College Level Academic Skills (CLAS) GPA and testing alternative options. In addition, colleges ask the FCS's data warehousing unit to provide additional system-wide reports that contain critical performance data, such as student success in gatekeeper courses such as MAT 1033.

Using certain key accountability measures (like Student Success Rates) as peer benchmarks after a multi-year progression of the QEP, additional internal assessment data should be able to determine the extent to which the QEP implementation contributes to improvements in these measures. Thus, the College has established an additional, supplementary mechanism to evaluate the QEP's success by tracking student performance and completion rates over the later part of the QEP implementation period and analyzing its impact on the overall College scores across a selected set of accountability measures.

Since these measures correlate with the College's strategic goals and the associated KPI set, this data will also provide a critical link between the QEP, the institutional IE and planning process, and potential planning scenarios that would involve the transferability of the QEP-related practices across other key instructional area of the College.

Interim Reports

As stated before, most of the summative assessment data and results of the various supplemental assessment measures will be published as part of the QEP summary of Polk State College's annual *Institutional Effectiveness Report*. However, several data summaries will be available to faculty, departments, and administrative functions after the end of each fall and spring term, mainly based on their value to provide effective feedback to the individual MAT 1033 instructors and to inform instructional improvement initiatives, ongoing faculty development, and the design of faculty and administrative workshops.

In addition, the Office of Institutional Research, Effectiveness, and Planning will report ad-hoc data and specific findings to facilitate college-wide use of the results for inclusion in meetings, departmental data reporting, and related faculty communications. Additional ad-hoc reports could also be useful to assist in selection of specific topics for workshops and guest speakers and to provide alternative performance measures or success indicators.

QEP Assessment Plan

As indicated in Chapter 8, the Director of Institutional Research, Effectiveness, and Planning will provide assessment oversight of the Quality Enhancement Plan and will ensure its coordination with the overarching college planning and institutional effectiveness processes. The Director will lead the Assessment and Evaluation Team and the statistical analyses of all QEP related data, will provide annual QEP evaluation updates, and will communicate assessment issues with the QEP Director, the QEP Advisory Council, and other QEP-relevant functions.

All assessment items have well-defined target percentages as expected outcomes assigned to them. Because no established baseline measures or peer benchmarks are available for many of these items, some target values might require further adjustments in the course of the QEP implementation. To review and address expectations that appear either too high or too low will be a key responsibility of the QEP Committee throughout the years. Any modifications to those values will be conducted in synergy between the QEP Implementation Team and MAT 1033 faculty to ensure the highest degree of faculty involvement across all QEP-related decision-making processes.

The annual QEP Evaluation Report will contain data summaries and assessment detail for SLO and performance elements of the QEP. The data will be aggregated during each summer term and presented to mathematics faculty and the various QEP committees and teams, to the College's administration, and to other college constituencies (e.g., the Planning and Budget Council, the Institutional Effectiveness Council, and the Faculty Senate) for further discussion and input. The annual report will also provide progress indicators and an overall effectiveness map for the activities described in the QEP implementation outline across all desired QEP outcomes and objectives. These measures will summarize the results of the various statistical analyses (correlations, multivariate regression, general linear modeling, survival analysis, predictive modeling, etc.) by the Assessment and Evaluation Team.

Part of the analyses will be a detailed review for all QEP objectives, including how effective each implementation component has been. The analysis is designed to support the

QEP Director, the Implementation Team, and the QEP Advisory Council with sufficient data for recommendations concerning the practical aspects of the QEP implementation underway, or to moderate expectations with regard to the definitions of goals and performance thresholds defined in this planning document. In addition, the College will communicate annual outcomes, plan adjustments, and other relevant changes via the College's QEP website and student forums to discuss and potentially incorporate student suggestions to improve the QEP. Figure 10-1 below depicts the typical annual assessment timeline for the duration of the QEP.

Figure 10-1: Typical Annual QEP Assessment Flow (Fiscal/Reporting Year)

Input	Time	Output
Spring Self-Evaluation by MAT 1033 Faculty →	Jul	→ Previous Year QEP Cost Summary
Summer SPI and Student Survey Data →		
Summer SLO Measures From Math Department →	Aug	
Fall Second Day Student Questionnaire Data →		→ Summer Data Report to Faculty
Summer Self-Evaluation by MAT 1033 Faculty →	Sep	→ Annual Summary Data to QEP Teams and Committees
Annual Accountability Data from FLDOE →		
Annual Tracking Data from Student Database →	Oct	
Previous AY Auxiliary Data (Workshops, etc.) →		→ Annual QEP Report to College
Feedback to Annual QEP Report →	Nov	
Fall SPI and Student Survey Data →	Dec	
Fall SLO Measures From Math Department →	Jan	
Spring Second Day Student Questionnaire Data →		→ Fall Data Report to Faculty
Fall Self-Evaluation by MAT 1033 Faculty →	Feb	
Spring SPI and Student Survey Data →	May	
Spring Second Day Student Questionnaire Data →		
Spring SLO Measures From Math Department →	Jun	→ Spring Data Report to Faculty
End-of Fiscal Year QEP Resource/Cost Data →		

A summary overview of all key assessment measures associated with Polk State College's QEP is provided via Table 10-1 on the following pages. The table is organized by the goals, sub-categories, and numbering sequence of the QEP's learning outcomes and objectives described in Chapter 4 of this planning document. Each of the main table sections shows first the respective implementation goal, then the associated core objectives, while the subsequent rows list the definition of expected outcomes for each core objective in the second column, followed by a brief description of the associated assessment measures and measurement logistics in the last two columns.

Table 10-1 does not reflect any auxiliary measures, such as workshop participation rates and professional development evaluation measures, which are mainly used to inform the process-continuity of the QEP implementation and are not expected to directly and critically impact the success of the QEP.

Summary of Key Assessment Measures

Table 10-1: Polk State College - QEP Assessment Plan

Goal 1	Student learning in Intermediate Algebra (MAT 1033) will improve.

#	Definition of Expected Outcome	Assessment Measure	Measurement Logistics
1.1	**Students will demonstrate mathematical skills and competencies based on an end-of-course assessment in MAT 1033.**		
1.1.1	At least 60% of the students will be able to solve and graph systems of equations and inequalities.	The current assessment tools and process used by the Mathematics department will cover all aspects and elements of these objectives and their associated learning outcomes.	Departmental math tests will be administered each term to all MAT 1033 students enrolled and present at the time of test administration.
1.1.2	At least 60% of the students will be able to perform basic operations with functions.		
1.1.3	At least 60% of the students will be able to factor polynomials and solve quadratic equations		
1.1.4	At least 60% of the students will be able to simplify and solve rational expressions and equations.		
1.1.5	At least 75% of the students will be able to simplify expressions involving fractional exponents or radicals.		
1.2	**Full-time and adjunct faculty will demonstrate integrated learner-centered teaching practices in mathematics.**		
1.2.1	At least 80% of the students will report that the professor uses learner-centered teaching strategies.	Student Perception of Instruction (SPI) survey (extended version for MAT 1033)	Administered at end of each term to MAT 1033 students across all sections
1.2.2	All MAT 1033 faculty will move annually at least three progression steps toward the learner-centered end of the Learner-Centered Teaching Rubric (one progression step for faculty teaching only one semester).	Learner-Centered Teaching Rubric and Transformation Checklist	Self-assessment for each class at the end of the term

Goal 2	The learning environment for Intermediate Algebra (MAT 1033) students will be supportive.

#	Definition of Expected Outcome	Assessment Measure	Measurement Logistics
2.1	**Students will experience a supportive learning environment in the classroom.**		
2.1.1	At least 80% of the students will respond favorably to questions about their first-day classroom experience.	Second Day Questionnaire	All MAT 1033 students present at the second day of instruction
2.1.2	At least 80% of the students will respond favorably to questions about student-instructor interaction.	Extended SPI and QEP Survey	Administered at end of each term to all MAT 1033 students
2.2	**Students will favorably evaluate the educational support services of the TLCC in regard to MAT 1033.**		
2.2.1	At least 80% of students using TLCC tutoring services for MAT 1033 will respond favorably to questions about TLCC tutoring services.	Addressed by items of the college's QEP online survey (self-select format)	Survey link w/ access code via e-mail to all MAT 1033 students at the end of term
2.2.2	At least 80% of students using TLCC computer services for MAT 1033 will respond favorably to questions about TLCC computer services.		
2.2.3	At least 50% of MAT 1033 students will use the TLCC's tutorial services.	Extended SPI and QEP Survey	See 2.1.2
2.3	**Students will favorably evaluate the educational support services of the library in regard to MAT 1033.**		
2.3.1	At least 80% of students using the library or library services for MAT 1033 will respond favorably to questions about the educational support services of the library in regard to MAT 1033.	see 2.2.1	see 2.2.1
2.4	**Students will favorably evaluate support from Student Services in regard to their support of MAT 1033.**		
2.4.1	At least 80% of the students will respond favorably to questions about registering for MAT 1033.	see 2.2.1	see 2.2.1
2.4.2	At least 80% of students seeking help with their MAT 1033 class from an advisor or student services personnel, will indicate a positive experience.		

2.5	**Students will favorably evaluate the support of the College as a whole.**		
2.5.1	At least 80% of the students will report that they discussed their degree or goals with someone who works at Polk State College.	see 2.2.1	see 2.2.1
2.5.2	At least 80% of the students will report that they made a personal connection with someone who works at Polk State College.		
2.5.3	At least 80% of students will respond favorably to questions about the quality of support they received concerning the achievement of their academic goals.		
2.6	**Students taking MAT 1033 will persist in the class and achieve their academic goals.**		
2.6.1	At least 70% of the students taking MAT 1033 will still be enrolled after the withdrawal date.	Student Database (SDB)	Data extracted from the SDB submission to the FDOE for each term and aggregated for evaluation
2.6.2	At least 90% of the students who are not successful in MAT 1033 will re-enroll in the course in the same or the following academic year.	Student Database (SDB)	
2.6.3	At least 80% of students successfully completing MAT 1033 will be retained at Polk State College during the following academic year.	Student Database (SDB)	
2.6.4	At least 70% of students successfully completing MAT 1033 will be either retained until completing a degree or leave in good standing.	Student Database (SDB)	
QEP Outcomes (not covered by the assessment measures above)			
#2	75% of students who take MAT 1033 will successfully complete it on the first attempt.	Student Database (SDB)	Data extracted from the SDB submission to the FDOE for each term and aggregated for evaluation.
#3	80% of students who successfully complete MAT 1033 will be successful in the subsequent mathematics course.	Student Database (SDB)	
#4	60% of students taking MAT 1033 will graduate in their selected degree program within 150% of time required for the degree completion for full-time students and within 250% of time required for the degree for part-time students. [Note: compared to 2.6.4, this measure will also assess outcomes by degree program and disregard transfer-out student proportions.]	Student Database (SDB)	

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Appendices

Appendix A: Topic Ideas Categorized by Themes

Study Skills/ College Success	• Mandatory and/or improved College Success course for all developmental students – first year • Mandatory and/or improved college orientation • Diverse delivery systems for both College Success course and orientation (online, face-to-face traditional, summer bridge program, hybrid, self-paced)
Technology	• Technology in classroom is essential to quality teaching and learning. • Improve communication between students, faculty, and adjuncts through technology.
Resources	• Faculty o Longer office hours o Office hours in TLCC to help tutor their students o More one-to-one instruction/coaching • Funding o Offer funding for additional work for adjuncts o Funding for more tutors • Learning Environment o Updated and clean facilities o Designated “quiet” study areas o Up-to-date technology o Offer more classes in the morning or afternoon o Encourage more study groups o Exit exams for failing students o Online degrees • Student Services o Add additional support in Student Services o Scheduled appointments o Mentors for students • Community o Offer enrichment opportunities for parents and students o Promote Florida Pre-paid Program
College Preparatory Courses	• Mathematics o Open entry/open exit college preparatory math o Addition of a computerized math lab component o Increased number of math labs o Increased contact hours o Redesigned college preparatory math courses o Prescriptive information for entrance testing and remediation o Additional tutoring o Mandatory group study o Diversified teaching methods

	• English o Focus on basic grammar, not research o Institute a grammar exit exam
Learning Communities	• Match tutor with professor • Create communities for developmental students and honors students
New Programs	• Cultural awareness through international study • Internships • Environmental programs
Professional Development Focus	• Teaching methods • Best practices • Faculty evaluations and timely feedback • Faculty accountability • College culture and attitudes
General Education	• Adopt math skills across the curriculum • Adopt writing skills across the curriculum • Improve communication skills across the curriculum
Retention/ Attrition	• Orientations prior to the semester are beneficial • Study strategies are lacking in students • Mentoring students is a positive way to provide guidance • Look for reasons why students leave college • Make use of learner-centered teaching

Appendix B: QEP - Institutional Survey Results

Polk State College: QEP Survey Results - Summer 2008		
1. What is the general college area you are working in?		
Teaching & Learning (Faculty, Program Director, etc.)	45	51%
Educational Support Services (TLCC, Library, etc.)	12	14%
College Administration (District Offices, Campus Admin)	12	14%
Administrative Support Services (HR, Purchasing, etc.)	9	10%
Student Support Services (Advising, Financial Aid, etc.)	7	8%
Corporate College/Workforce Non-Instructional	3	3%
Total	88	100%

2. What is the general area of Student Success you are most concerned about?		
College Prep Success	23	26%
Retention/Attrition	23	26%
Gen-Ed Competencies	16	18%
Student Life Skills	7	8%
Program Requirements	4	5%
Program/Course Selection	4	5%
Post-Graduation Success	4	5%
Learning Environment	3	3%
Time-To-Degree	2	2%
Other	2	2%
Total	88	100%

3. Please explain why you think the area you just selected is so important!
88 Responses
4. Considering your input above, please try to think about a more specific topic/issue that needs to be addressed to produce improvements in this area at PCC.
88 Responses
5. What do you think needs to be done in order to address this topic/issue successfully?
88 Responses
6. Who do you think needs to be involved in the process and why?
88 Responses

Appendix C: PRIDE Articles

PSC Polk State College

PRIDE

A Polk State College Publication for Faculty and Staff

APRIL 2010

Q-E-What? Q-E-P: A Path to Student Success

As spring turns to summer and summer to fall, you will see and hear more about the QEP, or Quality Enhancement Plan. This SACS requirement challenges PSC to find new ways to help students succeed.

After analyzing input from every college department, the QEP committee selected math, particularly student performance in Intermediate Algebra, as the focus of PSC's QEP. The four QEP initiatives include learner-centered teaching, a supportive learning environment, professional development, and technology usage. A logo contest is currently underway among PSC's students, based on our QEP theme and title: "Math: The Bridge to Success."

Although the QEP is focused on math, the entire PSC community will be involved in its implementation. Academic services, student services and support services will hold interdisciplinary discussions to explore how every area of the College can collaborate to improve outcomes in Intermediate Algebra.

The QEP will be submitted to SACS by Aug. 15, 2010. A couple of sections of the newly designed Intermediate Algebra classes are planned for the Fall 2010 term, with broader implementation in the spring after SACS approval.

The QEP Committee members are Kaye Betz (chair), Anna Butler, Bill Foege, Brittany Dickens, Charlie Lyle, Courtlann Thomas, Debra Laraway, George Urbano, Gregory Marshall, Herlencia Bowe, Ken Ross, Lynda Wolverton, Marvin Pippert, Maryanne Hyacinthe, Paul Pletcher, Penny Morris, Peter Usinger, Reggie Webb, Richard Leedy, Robert Gerber, Sandy May, Saul Reyes, Sheila Rios, Sherry Siler, Steve Frye, Trish Shuart and Wayne Kline. If you have questions or suggestions, please contact any member of the committee.

Students, Employees Join in Polk Arts Alliance Event

Race winners: *Winning third place in their age categories were Kaye Betz (far left) and Tracy Porter. Laurel Smith (right) won first place in her age category.*

The Polk Arts Alliance hosted its Bloomin' 5K Race for the Arts and Fun Walk and Wellness Expo on Saturday, March 6, at Fort Blount Park in Bartow. Held in collaboration with Bartow's 39th annual Bloomin' Arts Festival, which featured PSC student artists and live choral music by PSC choristers, the 5K gave several PSC employees a chance to show off their running skills.

Mathematics Professor Kaye Betz, PSC Foundation Executive Director and Associate VP of Development Tracy Porter, Lakeland Academic Dean Marvin Pippert, Psychology Professor Sanford Betz, Digital Media Professor Gokarna Ghatri-Chhetri, Health and Wellness Professor Laurel Smith and Director of Corporate College Rob Clancey all ran in the 5K.

The Polk Arts Alliance is a community organization dedicated to promoting the fine arts and arts education throughout the county. Founded in 2001, the Arts Alliance is a not-for-profit corporation recognized by the Florida Division of Cultural Affairs as a designated local arts agency.

PSC PRIDE 2010 page 7

LAC Student Center Gets Major Renovation

New gathering spot: *An architect's rendering shows the design of the new Lakeland Student Center.*

When Fall classes begin, Lakeland campus students will enjoy meals and each other's company in a new, expanded Student Center, located on two floors in the LAC building.

The $4.2 million renovation will expand the Student Center to 9,200 square feet, including a cafeteria area, vending, seating, a quiet study area, a computer area and a small auditorium.

The dining area can be set up to accommodate16 banquet tables and 99 chairs. The auditorium, with a seating capacity of 180, will be outfitted with two large screens, wireless microphones and touch screen audio-visual controls. A spiral staircase will lead to the second floor, where the Student Government offices and meeting space will be located. Between classes, students can enjoy ping-pong, foosball, X-Box, Play Station and Wii gaming systems.

The project will conform to the Leadership in Energy and Environmental Design's "green building" standards. The building will be outfitted with the latest technology, including Wi-Fi connectivity and digital signage for information and directions.

NISOD WINNERS

(continued from page 1)

year, the pair co-presented at the National Organization for Associate-Degree Nursing (NOADN).

Rebecca "Becky" Pugh, Professor of Education, also took home a NISOD award at the annual conference. Before entering the teaching field, Becky spent 20 years in business.

Becky holds a B.S. and an M.S. in Education from Indiana University and an Ed.D. in Educational Leadership from Nova Southeastern University. She holds National Board Certification (2002), Gifted Certification (2006) and ESOL Certification (2007).

At PSC, she teaches the introductory course for educators along with courses in diversity and educational technology. This fall, she will introduce a new classroom management course at PSC's Educator Preparation Institute (EPI).

In May, Becky and Cheryl will travel to Austin, Texas, to accept their Excellence Awards at the NISOD annual conference.

True to form, though, they'll do more than just pick up awards: Along with Sherri Davis and Beverly Woolery (who in April traveled to Jacksonville to pick up the National Council of Administrators Honorable Mention in Best Practices award for PSC's EPI), Becky will make a presentation about active learning entitled "Lectureholics Anonymous: Brain Breaks to Recovery."

Cheryl and Laura Glidewell will give a presentation called "It's Alive! The Use of Simulation in Nursing Education."

Math: The Bridge to Success

Something new is coming to Polk State College's campuses soon—a student-designed logo (pictured at right) to remind students, faculty, staff and stakeholders that the College is developing the Quality Enhancement Plan (QEP) called "Math: The Bridge to Success."

The QEP has two important functions. First, it focuses on improving student learning in Intermediate Algebra (MAT 1033), a course that too few students successfully complete. Student success in college and in the workforce is always our top priority here at PSC. Because Intermediate Algebra is required in most college programs, improving student success in this course can help students attain degrees or certificates and move into the workforce.

Second, the QEP fulfills one of the requirements for reaffirmation by the Southern Association of Colleges and Schools Commission on Colleges (SACS), which will be visiting PSC in October. SACS is the regional body for the accreditation of degree-granting higher education institutions in the Southern states.

The SACS mission is enhancing educational quality throughout the region in order to improve institutional effectiveness. Its primary focus is ensuring that institutions meet the standards established by the higher education community responsible for addressing the needs of society and students.

Expect to hear more about the QEP at our annual convocation in August and throughout the fall term—and be sure to look for the logo when you're walking around the campus.

Congratulations to the following students for winning the QEP Logo Design Contest:

First place ($200 Wal-Mart or PSC Bookstore Gift Card): Jesse Howell, Lakeland.

Second place ($75 Wal-Mart or PSC Bookstore Gift Card): Brian Adriano, Lakeland.

Third place ($50 Wal-Mart or PSC Bookstore Gift Card): Brian Adriano, Lakeland and Edgar Smith, Lake Alfred (tie).

Appendix D: Books Purchased

Assessing student learning: A common sense guide	Suskie, L	LB 2336. S87 2009	One each campus
Classroom assessment techniques: A handbook for college teachers	Angelo, Thomas A	LB2822.75 A54 1993	One each campus
Conquering math phobia: A painless primer	Clawson, Calvin	QA39.2 .C574 1991	Lakeland only
Creating learning communities: A practical guide to winning support, organizing for change, and implementing programs	Shapiro, Nancy	LB2331 .S473 1999	Lakeland only
Critical thinker's guide to educational fads: How to get beyond educational glitz & glitter	Elder, Linda	LB1027.3 .P38 2007	One each campus
Developing learner centered teaching: A practical guide for faculty	Blumberg, Phyllis	LB2331 .B55 2009	Two each campus
Glossary of critical thinking terms & concepts	Paul, Richard	BF441 .E423 2009	One each campus
Guide for educators to critical thinking competency standards	Elder, Linda	BF441 .P378 2007	One each campus
Helping students learn in a learner-centered environment: A guide to facilitating learning in higher education	Doyle, Terry	LB2331 .D66 2008	Two each campus
International critical thinking reading and writing test: How to assess close reading & substantive writing	Elder, Linda	LB1590.3 .E4347 I58 2006	One each campus
Learner-centered classroom practices & assessments: Maximizing students motivation, learning, & achievement	Miller, Lynda	LB1060 .M38 2007	Two each campus
Learner-centered teaching: Five key changes to practice	Weimer, Maryellen	LB2331 .W39 2002	Two each campus
Math & music: Harmonious connections	Garland, Trudi	Not received yet	Lakeland only
Miniature guide for those who teach on how to improve student learning: 30 practical ideas	Elder, Linda	LB 1060 .P38 2007	One each campus
Miniature guide to critical thinking: Concepts & tools	Paul, Richard	BF441 .P382 2009	One each campus
Miniature guide to practical ways for promoting active & cooperative learning	Paul, Richard	LB1060 .H54 2006	One each campus
Miniature guide to taking charge of the human mind	Paul, Richard	BF441. E424 2007	One each campus
Motivating students to learn, Second Edition	Brophy, Jere	Not received yet	3 each campus

Number sense and number nonsense: Understanding the challenges of learning math	Krasa, Nancy	QA141.15 K73 2009	One each campus
Teaching in the sciences: Learner-centered approaches	McLoughlin, Catherine	Q181 .3515 2005	Lakeland only
Thinker's guide for conscientious citizens on how to detect media bias & propaganda in national & world news	Elder, Linda	PN4784 .O24 P38 2008	One each campus
Thinker's guide for students & faculty to scientific thinking	Elder, Linda	BF441 .P3866 2008	One each campus
Thinker's guide for students on how to study & learn a discipline using critical concepts & tools	Elder, Linda	BF441 .P383 2007	One each campus
Thinker's guide to analytic thinking	Paul, Richard	BF441 .E42 2010	One each campus
Thinker's guide to engineering reasoning	Niewoehner, Robert	T65. P38 2007	One each campus
Thinker's guide to fallacies: The art of mental trickery & manipulation	Elder, Linda	BC175 .P385 2006	One each campus
Thinker's guide to how to read a paragraph: The art of close reading	Elder, Linda	LB1050.45 .P38 2008	One each campus
Thinker's guide to how to write a paragraph: The art of substantive writing	Elder, Linda	PE1439 .P39 2007	One each campus
Thinker's guide to intellectual standards	Paul, Richard	BF441 .E45 2008	One each campus
Thinker's guide to the art of asking essential questions	Paul, Richard	BF441 .E54 2009	One each campus
Thinker's guide to the art of Socratic questioning	Elder, Linda	BC 199.Q4 P38 2007	One each campus
Thinker's guide to the nature & functions of critical & creative thinking	Elder, Linda	BF442 .P38 2008	One each campus
Thinker's guide to understanding the foundations of ethical reasoning	Elder, Linda	BJ1031 .P385 2009	One each campus

Appendix E: Summative List of Activities during the Development Phase

Time	Activity
Academic Year 2007-2008	
	QEP requirement/opportunity is briefly introduced at the fall faculty meeting.
	Delegation attends the SACS summer institute.
Fall 2008	
	Concept of creating a QEP is introduced to all employees via special departmental meetings coordinated by the Vice President for Academic and Student Services.
	PSC delegation attends annual SACS meeting.
	PSC QEP Steering Committee established (later known as QEP Committee).
	QEP Committee begins to discuss possible study topics.
	Topic list narrowed.
Spring 2009	
	QEP Committee meets regularly.
	Focus identified – Intermediate Algebra (MAT 1033).
	Framework developed.
	Learning outcomes and key initiatives determined.
	Mathematics department meets to discuss learning and Intermediate Algebra.
	Teams for literature review, data review, focus groups, marketing, implementation, travel, budget, and writing are established.
Summer 2009	
	QEP Committee meets regularly.
	Teams meet regularly and provide updates to the QEP Committee.
	Student focus groups conducted.
	Draft outline developed.
	Math tutor focus group conducted.
	Survey questions for fall developed: student survey, mathematics faculty survey, and a survey for other schools that have relevant QEPs.
	Two mathematics faculty attend The Teaching Professor Conference and report findings to mathematics faculty and QEP Committee.
	Six mathematics faculty attend AMATYC's Beyond Crossroads workshop and report findings to mathematics faculty and QEP Committee.
	QEP Chair and SACS liaison attend the Summer SACS Institute and report findings to QEP Committee.
Fall 2009	
	QEP Committee meets regularly.
	Teams meet regularly and provide updates to the QEP Committee.
	QEP update provided to all faculty and staff at convocation.
	Faculty workshop on learning-centered syllabus presented to faculty.
	Mathematics department meets to discuss learning and Intermediate Algebra.
	QEP website and QEP Facebook web page developed.
	Student survey conducted in math classes.
	Mathematics faculty survey completed.

	Four mathematics faculty attended the AMATYC conference.
	QEP progress reviewed at math department meetings.
	QEP update presented to District Board of Trustees.
	Presenter from Northwest Mississippi Community College with similar QEP brought to college to speak about their experiences.
	QEP Committee members attend the Southern Association of Colleges and Schools Commission on Colleges Annual Meeting.
Spring 2010	
	QEP Committee and QEP teams meet regularly.
	Dr. Maryellen Weimer presents faculty workshop on learner-centered teaching.
	QEP draft revised.
	Title determination process begins.
	Student survey finalized and distributed.
	QEP update presented to college departments at scheduled meetings.
	QEP update presented to District Board of Trustees.
	Mathematics department meets to discuss learning and Intermediate Algebra.
	Final QEP literature review published.
	Title finalized, “Math: The Bridge to Success.”
	Student logo design contest announced.
	Logo finalized; brochure developed.
	Document drafts reviewed and edited.
	XITRACS account established for uploading all QEP documentation.
	QEP information appears in *PRIDE, The Ledger,* and *News Chief.*
Summer 2010	
	QEP Committee and QEP teams meet regularly.
	Marketing items ordered.
	Document finalized.
	Seven mathematics faculty attend The Teaching Professor Conference.
	Three mathematics faculty attend The Learning College Summit.
	Mathematics department meets to discuss learning and Intermediate Algebra
	On-site review preparations begin (October 5-7, 2010).
	QEP committee members attend SACS Summer Institute.
Fall 2010	
	QEP Committee meets regularly.
	Marketing push begins with Convocation.
	Prepare for on-site review (October 5-7, 2010).
	College President sends reminders to college community.
	Dr. Phyllis Blumberg holds videoconference with mathematics faculty.
	Dr. Phyllis Blumberg holds workshop with mathematics faculty.
	Two Intermediate Algebra (MAT 1033) classes are taught with new design.
	QEP submitted for review 6 weeks prior to scheduled on-site visit.
	SACS Team visit.

Appendix F: Student Focus Group Report

QEP-Success in Math Courses at PCC
Focus Group Study Results
June 2009

A random sample of students who are currently enrolled for the first time or have previously enrolled in a math course(s) at PCC was identified by the Office of Institutional Research. This population was contacted for voluntary participation in the study and a total of 12 focus-group sessions (6 on the Winter Haven Campus and 6 on the Lakeland campus) were scheduled over a period of 2 weeks. The focus group sessions were held in Student Services conference rooms at each campus and ranged in duration from 45 minutes to an hour.

One to two members of the Quality Enhancement Plan Committee facilitated each session. The sessions were recorded and transcribed by an administrative assistant.

Participants were greeted, seated, and asked to partake of the refreshments provided and make themselves comfortable before each session began. Participants were also given a welcome letter from the College President, wherein she thanked attendees for their participation in the study and their honest feedback, and ensured them that all comments would be kept confidential.

The focus group participants were provided with the following guidelines:

- Stay positive;
- Everyone's participation is important to the study;
- All constructive criticism is encouraged and of value to the study;
- Do not identify any faculty or staff by name, description, good or derogatory comments;
- Feedback, information, and comments collected as part of today's activity will remain anonymous and will not impact you academically.

A series of questions were asked of the participants that ranged from their expectations of the course, individual success strategies, institutional and instructor support, preparation of future students, and improvement of the learning experience in the college's math courses.

1. **What were your expectations of the Basic Algebra (MAT 0024) or Intermediate Algebra (MAT 1033) course? Student Feedback:**

    - To be taken as a refresher course, since I had not taken math since high school.
    - It was a struggle for me since it had been a while since I had taken a math course. Also, I had a lot of distractions.
    - I thought it would be average, but because I work full time, it was hard to get everything thing done.
    - I which I had taken pre-algebra (MAT 0012) to have prepared me better. I did have trouble understanding the teacher.
    - I didn't have any, other than getting through the prerequisites, passing and going on to the next class. My understanding was that for the hour of class she would need to devote four hours' preparation. Going into 1033 I was ecstatic, because the credits would finally count. It was needed for my degree, so I was happy to get into it.

2. **If you passed the course the first time you enrolled, what did you do to successfully complete the course? Student Feedback:**

    - Study, and if I did not understand something I would watch the DVD that came with the book.

- I used the study groups and also when it got real hard around finals time, I paid for private tutor.
- I used My Math Lab and had to study as much as I could.
- I used the study groups that were available, and if they did not have one I would meet with another classmate. Also, I would check out video lessons from the TLCC.
- I spent more time on 1033. MAT 0024 added onto the basics of 0012, and the building blocks made sense. MAT 1033 was all over the board; the material they were learning seemed disorganized rather than building on the fundamentals. It was that way in the textbook.
- MAT 0024 did help me definitely in 1033.
- I almost dropped 1033 when I failed the first test, but others encouraged me to stay in it.
- We lost 2/3 of the class [students in MAT 1033] over the 16 weeks, but I passed the class in my first attempt.
- I spent a lot of time doing the homework. There were no shortcuts. I devoted around 10 hours per week in preparation.
- The student manual is a fantastic accompaniment to the textbook. It is an optional item and costs about $36.
- MyMathLab was known about, but it requires extra money.
- I also used a dry-erase board.
- I worked with another student (who sat next to me in class), and that partnership made me successful. My study partner and I were opposites, so we were able to help each other.
- I used the tutors a lot, and there was one who was very helpful.
- I understand why the instructor doesn't collect the homework or grade it. I did stop by the professor's office some for help.
- The tests were really the only thing that let you know how you are doing.

3. What did your instructor do to help you to be successful in the course? Please be specific. Student Feedback:

- Gave shortcuts to help solve the problems.
- The instructor had us write the problems out on the board, which helped a lot to re-write the problems.
- I don't really know but, the instructor did explain everything really well.
- I think that the instructor did a great job by explaining the lesson.
- In MAT 0024, the instructor was very personable and could explain the math problems – would use additional problems, work on the board and Visualizer – and was available in the classroom 15 minutes before class. In 1033 the instructor was a "regurgitated computer," and had a different personality.
- The instructor in 0024 engaged students and took time to understand. In 1033 it was strictly business, close to the book and they would move on whether students got it or not. There is usually more than one student having a problem, and some are timid. When instructors don't come across very personable, it creates a wall. You may feel stupid and not want to ask questions.

With the amount of content in 1033 being different, did that contribute? (This was a follow-up question added by the facilitator.)

- I think it was a combination of both that and the instructor's personality. Out of all the other classes, I didn't feel the anxiety like I had in this class [1033].
- After taking 1033 I changed her major, so I don't have to take any more math.

4. **What academic advice would you give a student who just enrolled in a Basic Algebra (MAT 0024) or Intermediate Algebra (MAT 1033) course at Polk Community College?**

    - Make sure they have a grasp of pre-algebra.
    - Make sure you know how to use the graphing calculator, because the instructors will teach like you already know how to use them.
    - Make sure that you can handle the class if you work full-time.
    - I found that students who completed the course did put a lot of time into it. That helped them be successful. My study partner and I encouraged others to go to the tutors. Tutoring is great, because it is free and the hours are flexible. Tutoring is key. The manual helps with both classes, and those two things are the students' best friends for math classes. It might be helpful to go to the TLCC right after class while it is still fresh, and do the homework then. [She thinks most students do their homework.] Practice tests helped with reviewing all information.

5. **As a college, we are interested in improving the learning experience in our math courses. How can we improve?**

    - Maybe to add My Math Lab into all the math courses.
    - I think that there needs to be more trained math tutors available, also it would be helpful for the class to have more than 50 minutes to take a test. I think standards tests should be given out for all the teachers.
    - I think that it would be helpful to have podcasts of the teacher's lesson, that way if we missed anything we could watch it to review.
    - I think we should re-look at improving the CPT.
    - If there were quizzes more often, that might help since one is thrown out. We only had four. In my other classes there were six. Also when there are only four, it covers more content. More assessments would help the students evaluate what they've learned.
    - Reaffirmation from my instructor would have been good to let me know I was getting it.
    - The instructor didn't promote the student manual, but I feel if they did it would be very beneficial and would also help bookstore sales.
    - All the tools are there and if used, the students will get through the classes. The college has the tools and if students don't take advantage of them, shame on them.
    - If there would be a way to streamline the content of 1033 – maybe less content in 16 weeks, or maybe 1 ½ hours or 1 hr. 45 min. and still meet twice a week – that might help.

    What if a lab was added? (This was a follow-up question added by the facilitator.)

    - I would have been glad for that. Additional structured time would be good.
    - The help sessions often occurred when I was at work, so other times were needed for the sessions like evenings and maybe weekends.
    - Cohorts might also be good; I'm taking another class with the same study partner.

Although the student participation in the focus group study was limited, the feedback provided by the students was valuable. The obtained information will help bring some direction to the survey instrument being developed by the Office of Institutional Research and further help identify areas of focus for the QEP.

Appendix G: List of Twenty-Nine Learner-Centered Components

A. The Function of Content

1. Varied uses of content: In addition to building a knowledge base, instructor uses content to help students know why they need to learn content, acquire discipline-specific learning methodologies, use inquiry or ways of thinking in the discipline, and learn to solve real-world problems.
2. Level to which students engage in content
3. Use of organizing schemes
4. Use of content to facilitate future learning

B. The Role of the Instructor

1. Creation of an environment for learning through organization and use of material that accommodates different learning styles
2. Alignment of the course components-objectives, teaching or learning methods, and assessment methods – for consistency
3. Teaching or learning methods appropriate for student learning goals
4. Activities involving student, instructor, content interactions
5. Articulation of SMART objectives: Specific, Measureable, Attainable, Relevant, Time oriented
6. Motivation of students to learn (intrinsic drive to learn versus extrinsic reasons to earn grades)

C. The Responsibility for Learning

1. Responsibility for learning
2. Learning to learn skills for the present and the future - including, for example: time management, self-monitoring, goal setting, how to do independent reading, and how to conduct original research
3. Self-directed, lifelong learning skills - including, for example: determining a personal need to know more, knowing who to ask or where to seek information, determining when need is met, and development of self-awareness of students' own learning abilities
4. Students' self-assessment of their learning
5. Students' self-assessment of their strengths and weaknesses
6. Information literacy skills: framing questions, accessing sources, evaluating sources, evaluating content, and using information legally (as defined by the Association of College and Research Libraries)

D. The Purposes and Processes of Assessment

1. Assessment within the learning process
2. Formative assessment (giving feedback to foster improvement)
3. Peer and self assessment
4. Demonstration of mastery and ability to learn from mistakes
5. Justification of the accuracy of answers
6. Timeframe for feedback
7. Authentic assessment (what practitioners/professionals do)

E. The Balance of Power

1. Determination of course content
2. Expression of alternative perspectives
3. Determination of how students earn grades
4. Use of open-ended assignments
5. Flexibility of course policies, assessment methods, learning methods, and deadlines
6. Opportunities to learn

Appendix H: Sample Rubric for Developing Learner-Centered Teaching

The Rubric for the Function of Content Dimension of Learner-Centered Teaching

The Function Of Content				
COMPONENT	**Employs <u>instructor-centered</u> approaches →**	**→ Transitioning to learner-centered approaches →**		**Employs <u>learner-centered</u> Approaches**
		Lower level of transitioning	**Higher level of transitioning**	
1. Varied uses of content In addition to building a knowledge base, instructor uses content to help students:	Instructor uses content that helps students build a knowledge base	In addition to building a knowledge base, instructor uses content to help students:	In addition to building a knowledge base, instructor uses content to help students:	In addition to building a knowledge base, instructor uses all 4 sub-criteria to help students in the following ways:
▪ know why they need to learn content ▪ acquire discipline-specific learning methodologies such as how to read primary source material ▪ use inquiry or ways of thinking in the discipline		▪ recognize why they need to learn the content	▪ identify why they need to learn content ▪ use discipline-specific learning methodologies with instructor's assistance ▪ use inquiry or ways of thinking in the discipline with the instructor's assistance	▪ evaluate why they need to learn content ▪ acquire discipline-specific learning methodologies ▪ practice using inquiry or ways of thinking in the discipline
▪ learn to solve real world problems	▪ Instructor and content help students solve problems **-OR-** Uses any 1 or none of the 4 sub-criteria for uses of content	▪ apply content to solve problems with instructor's assistance **--OR—** Uses any 2 of the 4 sub-criteria for uses of content	▪ learn to apply content to solve real world problems with instructor's assistance **--OR--** Uses any 3 of the 4 sub-criteria for uses of content	▪ learn to solve real world problems

The Function Of Content (continued)				
COMPONENT	**Employs instructor-centered approaches →**	**→ Transitioning to learner-centered approaches →**		**Employs learner-centered Approaches**
		Lower level of transitioning	**Higher level of transitioning**	
2. Level to which students engage in content	Instructor allows students to memorize content	Instructor provides content so students can learn material as given to them without transforming or reflecting on it	Instructor assists students to transform and reflect on some of content to make their own meaning out of some of it	Instructor encourages students to transform and reflect on most of the content to make their own meaning out of it
3. Use of organizing schemes	Students learn content without a clearly defined organizing scheme provided by instructor	Instructor provides limited organizing assistance	Instructor provides some organizing schemes to help students learn content	Instructor provides and uses organizing schemes to help students learn content
4. Use of content to facilitate future learning	Instructor provides content so students can learn it in isolation, without providing opportunities for them to apply knowledge to new content	Instructor provides students with limited opportunities to apply knowledge to new content	Instructor frames content so students can see how it can be applied in the future	Instructor frames and organizes content so students can learn additional content that is not taught

Appendix I: Documentation to Support Selected Status Form (1st of 11-page form)

The Documentation to Support the Selected Status Form

Complete this form if you are doing an assessment for the purposes of educational program evaluation, or as part of a teaching dossier. If you are completing the rubrics for the purposes of beginning to transform your teaching, you can skip this form.

Refer to the rubrics as you complete this form.

Name: Date:

What are you assessing?

Course Name(s) _____

Educational Program Name _____

Other _____

Purpose of this assessment:

The Function of Content

Component 1. Varied uses of content

In addition to building a knowledge base, instructor uses content to help students: know why they need to learn content, acquire discipline-specific learning methodologies such as how to read primary source material, use inquiry or ways of thinking in the discipline, learn to solve real-world problems.

Current level:

❑ Instructor-centered

❑ Lower level of transitioning

❑ Higher level of transitioning

❑ Learner-centered

Rationale for or example to support level chosen:

Blumberg, P. (2009). *Developing Learner-Centered Teaching: A Practical Guide for Faculty.* San Francisco: Jossey-Bass. This material may be copied, but this reference must be cited.

(*Continued*)

Appendix J: Planning for Transformation Exercise

Use this form to begin to transform a course to be more learner-centered. Complete the Planning for Transformation Exercise for each component you plan to change. If you are completing the rubrics for the purposes of a formal assessment of an educational program or of teaching, you can skip this form.

A. **Status of your course now** Date:

1. Dimension of learner-centered teaching:

2. Component:

3. Current level:
   higher level of transitioning, lower level of transitioning, instructor-centered
   ☐ ☐ ☐

4. Briefly describe your current implementation (for the purposes of documenting your baseline prior to transformation).

B. **Desired changes**

1. Describe the desired change(s) you wish to make for this component in the near future.

2. What is the level you want to achieve with this/ these change(s)?
   Learner-centered higher level of transitioning lower level of transitioning
   ☐ ☐ ☐

C. **Tactical planning questions**

1. What do you need to do, decide or learn about prior to making changes?

2. What obstacles or challenges do you need to overcome to implement successfully this change? (Resistance may come from your philosophy of teaching, your chair, your peers, your students, or the culture of your institution.)

3. Identify specific strategies (such as learning about successful implementations, trying a small pilot implementation, explaining to your students and other instructors why you are making these changes) for overcoming each obstacle or challenge.

4. What resources (such as time, money, student assistants, or computer software) would help you implement your change?

5. What do you need to do to get your students to accept this change? (Possibilities include repeated explanations for why you are doing what you are doing or having the activity count in the final grade.)

D. **Outcomes of the change**

1. In what ways will implementing this change influence other aspects of your course to be more learner-centered? [For example, when you incorporate various teaching/ learning methods that are consistent with your student learning goals, (the third component of The Role Of The Instructor dimension), most likely the students will more actively engage in the content (the second component in The Function Of Content dimension).]

2. In what ways (such as increased learning), will your students benefit from this change? How will the students behave differently (such as increased participation in class or greater engagement with the content)?

3. In what ways will you benefit from this change? (For example, - enjoy teaching more, satisfied that your students are learning more, anticipate fewer student complaints)

E. **Possible future changes**

1. What is the optimal level for this component for this course?

Learner-centered	higher level of transitioning	lower level of transitioning
☐	☐	☐

2. In the long term, what additional changes, if any, might you make to transform further this component to reach this optimal level of learner-centered approach?

Appendix K: Sample of Ice-breaker Activity in the Toolbox

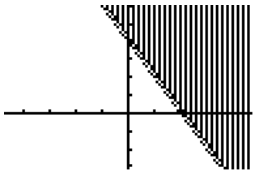
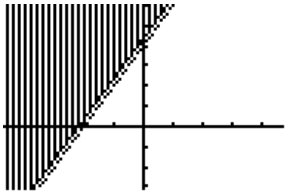
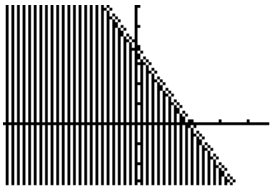
Title:	My N.A.M.E.
Time:	10 minutes
Purpose:	Everyone knows everyone else's name and some interesting things about each other.
Materials:	No Materials
Here's how:	1. Give students 5 minutes to think of interesting facts about themselves that correspond to the letters of their first name. 2. Have each participant share his or her acronym.
Example:	"Hi, I'm Logan. L is for Led Zepplin, my favorite rock group; O is for Ohio, where I was born; G is for German, the only foreign language I know; A is for Aunt Wendy, my favorite aunt; and N is for Nice because I'm a nice guy.
Tips:	1. If students get stuck, tell them they do not have to follow the rules strictly. L could stand for "loving chocolate." 2. Be prepared to share your own acronym as an example for the class.
Variations:	Instead of acronyms about themselves, have students make acronyms corresponding to their work or a current project that they are working on.
Contact Person:	Cate Igo

Appendix L: Sample of Clicker Questions in the Toolbox

QEP Objective 1.1:

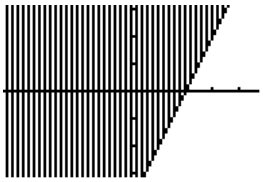
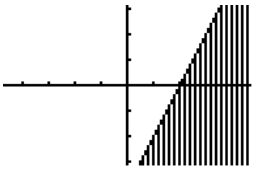
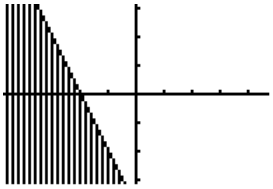
1: Graph a linear inequality in two variables that does not go through the origin and is a strict inequality.

Choose the correct graph for $4x + 2y < 8$:

(a)  (b)  (c) 

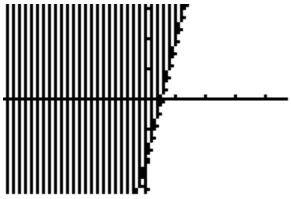
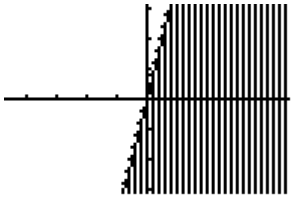
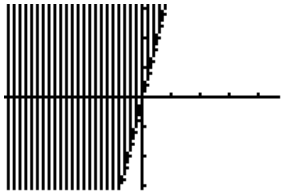
2: Graph a linear inequality in two variables that does not go through the origin and is not a strict inequality.

Choose the correct graph for $6x - 3y \leq 12$:

(a)  (b)  (c) 

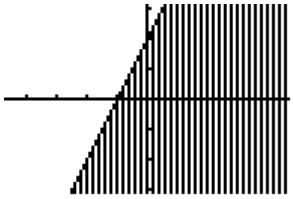
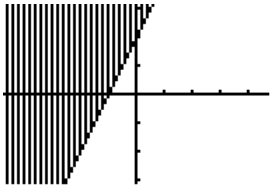
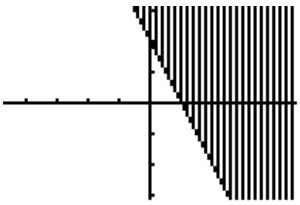
3: Graph a linear inequality in two variables that does go through the origin and is a strict inequality.

Choose the correct graph for $y > 4x$:

(a)  (b)  (c) 

4: Graph a linear inequality in two variables that does not go through the origin and is not a strict inequality.

Choose the correct graph for $4x - 2y \geq -4$:

(a)  (b)  (c) 

Appendix M: Sample of a Learner-Centered Toolbox Activity

QEP Toolbox Learner-Centered Activity

Title	Finding Highway Intersections
Activity Description	Students must define a Cartesian coordinate system on the geography, determine the coordinates of two towns, write an equation for the highway between them, and use the equation to find the x- and y-intercepts which correspond to highway intersections.
Student Learning Outcome	1.1.1: Solve and graph systems of equations and inequalities.
Specific Skills	- Find x- and y-intercepts. - Find the slope of a line given two points. - Write an equation, given two points on the line.
Time for Activity	40 minutes
Preparation Time	10 minutes
Materials Needed	- Copies of student directions, one for each student. - Whiteboard space and markers or flipcharts and markers. - A follow-up problem to work with two points given and asking for the equation of the line between the points and the x- and y-intercepts of the line.
Activity Procedure	- Organize the class into groups. - If group members do not know each other, provide a brief “get acquainted” activity. - Distribute student directions, give a brief opportunity for reading, then ask if there are any questions about the activity. - Designate working areas (whiteboard sections or flipcharts) and let groups choose where they want to work - When all groups have developed answers to 1a, ask groups to share them. - When all groups have written answers to 1b, ask the groups to share them. - When all groups have developed answers to 2a, ask groups to share them. - When all groups have written answers to 2b, ask the groups to share them. - Lead a brief class discussion of the process and results.
Activity Follow-up	Ask students to write a brief summary of the activity and what they learned from it.
Assessment Ideas	Give students the coordinates of two points and ask them to find the equation of the line between the points and the x- and y-intercepts of the line.
Contact Person	Steve Frye
Comments/ Tips	

Finding Highway Intersections (Exercise)

Expressway 90 runs east-west; Expressway 89 runs north-south. They intersect in a large city, Megopolis. The town of Smallville is 30 miles east and 40 miles north of Megopolis. Bigtown is 10 miles west and 20 miles north of Megopolis. The county is about to build a new highway between Smallville and Bigtown. An intersection must be built where the new highway crosses Expressway 89. The county will need to buy land for on- and off-ramps at the intersection, so the county needs to know ASAP exactly where the intersection will be. The county engineer needs help locating the intersection. He consults with a local math teacher who says he will ask his algebra students to help.

What steps would you use (what would your strategy be) to help the county engineer locate the intersection of the new highway and Expressway 89 using a Cartesian Coordinate System?

a) Using a few minutes of quiet time, let everyone in your group think of individual answers to the question.
b) Give all group members an opportunity to share their thoughts.
c) Determine a group strategy and write it down.
d) Select a spokesperson to share your group's strategy and reasoning with the class.

Find the location of the intersection of the new highway and Expressway 89.

e) After hearing all the groups, make any revisions to your strategy that you think appropriate.
f) Use your team strategy to answer 1b and write it down.
g) Select a spokesperson to share your group's answer with the class.

In the future, the new highway will be extended beyond the two towns. What steps would you use to determine where the intersection of the new highway and Expressway 90 will be?

h) Using a few minutes of quiet time, let everyone in your group think of individual answers to the question.
i) Give all group members an opportunity to share their thoughts.
j) Determine a group strategy and write it down.
k) Select a spokesperson to share your group's strategy and reasoning with the class.

Use your strategy to find the future intersection of new highway and Expressway 90.

l) After hearing all the groups, make any revisions to your strategy that you think appropriate.
m) Use your team strategy to answer 2b and write it down.
n) Select a spokesperson to share your group's answer with the class.

Appendix N: Basic Course Information (BCI) Sheet for MAT 1033

POLK STATE COLLEGE
MAT 1033 INTERMEDIATE ALGEBRA
LAKELAND DEAN'S OFFICE: LLC 2255 PHONE: (863) 297-1024
WINTER HAVEN DEAN'S OFFICE: WSC 101 PHONE: (863) 297-1020

CREDIT HOURS, PREREQUISITES, AND COURSE DESCRIPTION:
3 hours Lecture, 3 credits
Prerequisite: MAT 0024 or appropriate placement examination score
This course provides the foundation for higher-level courses in algebra through the development of algebraic skills, as well as examination of the basic mathematical principles underlying those skills. The course topics include factoring, rational expressions, linear and quadratic equations, rational exponents, radical expressions, graphing, systems of equations and inequalities, complex numbers, rational equations, functions, proportion and variation, and applications.

PSC MISSION AND CORE OBJECTIVES: Polk State College is a quality-driven educational institution, providing access to affordable associate and baccalaureate degrees, career certificates, and workforce development programs, delivered by diverse, qualified faculty and staff who are committed to student learning and achievement through the consistent practice of collaboration and focus on excellence. In line with this purpose, PSC's general education develops competence in the areas of 1) Communication, 2) Critical Thinking, 3) Scientific and Quantitative Reasoning, 4) Information Literacy, 5) Diversity, 6) Culture, 7) Ethics and 8) Social Responsibility. Please see the PSC catalog for complete descriptions of these outcomes. A primary focus of this course is competence related to the areas of:

2. Critical Thinking
Demonstrate the ability to reflect on, analyze, synthesize, and apply information through problem solving.

3. Scientific and Quantitative Reasoning
Understand and apply mathematical and scientific principles and methods to solve abstract and real-world problems.

COURSE OBJECTIVES:
At the end of this course, the student will be able to:

1. Use the characteristics of a line to write an equation or draw a graph.
2. Use boundary lines and shading to graph linear inequalities.
3. Determine the solution to systems of equations by graphing, substitution, and elimination.
4. Identify functions, use function notation, and evaluate functions.
5. Determine the domain and range of functions and use interval notation to write the domain and range.
6. Simplify algebraic expressions with integer or rational exponents..
7. Employ factoring techniques to completely factor binomials (including the sum and difference of two cubes), trinomials, and polynomials with four terms.
8. Solve quadratic equations by factoring.
9. Add, subtract, multiply, and divide rational expressions and simplify complex fractions.
10. Solve rational equations, including literal equations.
11. Use proportions as well as direct and indirect variation to solve application problems.
12. Add, subtract, multiply, divide, and simplify radical expressions.
13. Add and subtract complex numbers and use complex numbers to simplify expressions involving radicals with negative radicands.
14. Use the skills learned in this course to solve applications.

TEXTBOOK AND OTHER REQUIREMENTS: For textbook information, visit the campus bookstore, the bookstore website at www.efollet.com, or see the course syllabus.

COURSE CONTENT:

1. Linear equations in two variables and their graphs
2. Linear inequalities in two variables and their graphs
3. Systems of linear equations and inequalities
4. Evaluation of functions
5. Domain of functions
6. Rational exponents
7. Factoring
8. Quadratic equations
9. Rational expressions
10. Rational equations
11. Proportion and variation
12. Radical expressions
13. Complex numbers
14. Applications of the above topics

THE GORDON RULE: The Gordon Rule, State Rule 6A-10.30, requires A.A. program students to complete six semester hours of English and six semester hours of additional courses in which the student must demonstrate college-level writing skills through multiple assignments Because PSC uses a "Writing Across the Curriculum" approach to meeting the writing requirement, in addition to the required composition courses, any of the required social sciences and humanities courses will fulfill the writing requirement. This is not a Gordon rule writing course, but it may include writing assignments as part of course requirements.

In addition, State Rule 6A-10.30 requires A.A. program students complete six credits of college level mathematics. Taking the appropriate general education mathematics courses satisfies the mathematics portion of the requirement.

A minimum grade of “C” is required in all courses with primary responsibility for fulfilling the communications and mathematics areas of the general education requirements. This includes any course taken to complete the general education mathematics requirement, and the courses taken to complete the communications requirement.

STUDENT HELP: The professor is available for help during posted hours and by appointment during other non-class hours. Students are encouraged to seek assistance from the professor. To further the educational process, the campus Learning Resources Centers, comprised of a Teaching, Learning, and Computing Center (TLCC) and library, are available for student use. Each unit provides qualified staff and up-to-date equipment and facilities to promote student academic success. The TLCC provides tutoring services, computing resources, and other instructional support. The libraries provide information resources, individual and group study space, research assistance, information literacy instruction, and computing resources. Each facility provides free wireless access to the Internet. Library and TLCC hours of operation, including tutor schedules, are posed at each facility and on the PSC website.

WITHDRAWAL: Students may officially withdraw from course(s) during any given term, provided they follow appropriate policy and procedure. Following the conclusion of the Drop/Add period, students may officially withdraw without penalty from any credit course, provided they submit the appropriate forms to Student Services no later than the published deadline. The published deadline reflects approximately, but no more than, 70% of the term, based upon the course’s scheduled duration. It is the student’s responsibility to submit these withdrawal forms. Failure to do so may result in an “F” in the course. Under the Forgiveness Policy, students are allowed only three attempts in any one course, one initial enrollment and two repeats.

Students are not allowed to withdraw from a third course attempt. If a student stops attending class, the grade earned, usually an F, is assigned and posted. Prior to withdrawing from a course, students should consult the Financial Aid Office to determine what impact, if any, withdrawing has on financial aid status. Students cannot use course withdrawal to avoid academic dishonesty penalties. Students who have been penalized for academic dishonesty in a course are not eligible to withdraw from the course.

REPEATING A COURSE: Under the Forgiveness Policy, a student is allowed only three attempts in any one college credit course: one initial enrollment and two repeats. In certain circumstances, students may petition to repeat a credit course beyond the three attempts. Students should be aware that repeating courses may result in a higher course cost. A course cannot be repeated unless the previously earned grade is a "D," "F," or "W" (see College Catalog for details). Prior to repeating a course, students should consult the Financial Aid Office to determine what impact, if any, repeating has on financial aid status.

ACADEMIC INTEGRITY: Students are responsible for their own work. It is assumed that each student is honest and will abide by that standard. However, in the event there is an indication or suspicion that there has been a case of cheating/plagiarism, the situation will be dealt with in accordance with published College policy. Copies of this policy are available in Student Services offices.

INFORMATION TECHNOLOGY ACCESS/USE POLICY: All individuals who employ information technology resources provided by Polk State College (this includes, but is not limited to, telephones, computers, the PSC local area and wide area networks, and the Internet) must use these resources for academic purposes only. Use of these resources is a privilege, not a right. Inappropriate use can result in revocation or suspension of this privilege.

EQUAL OPPORTUNITY FOR STUDENTS WITH DISABILITES: If you are a student with a disability and will need special accommodations or auxiliary aids under the Americans with Disabilities Act (ADA), please contact the Coordinator of Academic Advising in Student Services on either campus.

EVALUATIVE CRITERIA: According to Math Department policies, the grade for the course will be based on grades earned on progress tests, a comprehensive final examination, and additional work as determined by the instructor. The additional work, optional with the instructor, may consist of a combination of homework, quizzes, computer assignments, projects, in-class work, or similar activities. The additional work, when chosen, will be combined into one grade and count as one progress test. Each progress test will count 100 points. The course average at any time prior to the final examination can be determined by finding the average of the progress tests at that time. See the instructor's syllabus for details of the instructor's policy for computation of the progress test average. The final examination will count as 25% of the final course average with the final course average calculated by the formula

$$\frac{3\,(\text{progress test average}) + \text{final exam percentage grade}}{4}$$

The course grade will be determined by using the following scale:

A = 90-100% B = 80-89% C = 70-79% D = 60-69% F = 0-59%

CALCULATOR POLICY: A scientific (non-graphing) calculator is allowed in this course for homework. A calculator may or may not be used on tests as directed by the instructor.

ATTENDANCE: Regular attendance is the student's responsibility. If a student has excessive absences (more than 3 hours), he/she may be dropped from the course with a "W" grade before the withdrawal date. After the withdrawal date, a student may receive an "F" grade for the course for excessive absences (more than 3 hours accumulated since the beginning of the term).

WORK MISSED: Make-ups will not be allowed for quizzes or tests. If a quiz is missed, the grade assigned for that quiz will be a zero (0). A grade of zero is also assigned for a missed unit test.

Appendix O: Glossary of Terms and Abbreviations

Acronym	Term
AA	Associate in Arts
AAS	Associate in Applied Science
AC	Assessment Coordinator
AMATYC	American Mathematical Association of Two-Year Colleges
AS	Associate in Science
AY	Academic Year
CCSSE	Community College Survey of Student Engagement
CLAS	College Level Academic Skills
CLAST	College-Level Academic Skills Test
DBOT	District Board of Trustees
EPA	Educational Program Assessment
FAQ	Frequently Asked Questions
FCS	Florida College System
FTE	Full-Time Equivalent
FTIC	First-Time-in-College
FTYCMA	Florida Two-Year College Mathematics Association
IE	Institutional Effectiveness
IREP	Institutional Research, Effectiveness, and Planning
KPI	Key Performance Indicator
MAA	Mathematical Association of America
NISOD	National Institute for Staff and Organizational Development
NSSE	National Survey of Student Engagement
PAL	Polk Access to Learning
PBL	Problem-Based Learning
QEP	Quality Enhancement Plan
SACS	Southern Association of Colleges and Schools
SDB	Student Database
SGA	Student Government Association
SPD	Staff and Program Development
SPI	Student Perception of Instruction
STEM	Science, Technology, Engineering, Mathematics
SUS	State University System
TCC	Tallahassee Community College
TLCC	Teaching/Learning Computing Center
WEQC	Workforce Education Quality Council