Unlocking the Gate: Faculty Professional Development for Increased

Student Success in Foundational and Gateway Courses

Thad Harrill

and

Brandon Smith

Committee Chair:

Jessica Weiler, Ph.D.,

Assistant Professor and Program Director for Educational Leadership,
Western Carolina University

Committee Members:

Brandi Hinnant-Crawford, Ph.D., Assistant Professor of Educational Research,

Western Carolina University

Lowell Davis, Ph.D., Associate Vice Chancellor for Student Success,

Western Carolina University

Betsy Barefoot, Ed.D., Senior Scholar, John N. Gardner Institute

Anne Oxenreider, M.A., M.Ed., Director of Institutional Assessment and Accreditation,

Isothermal Community College

March, 2020

Abstract

Foundational and gateway courses are critical prerequisites in educational systems. Unfortunately, they can be challenging for students, causing high failure rates, which correlate with reduced course persistence and program completion for all students. To address this problem of practice we applied a dissertation in practice model wherein professional development for evidence-based pedagogical practices was implemented. After the professional development, participating faculty refined how they delivered the courses using one or more of the following practices: transparent teaching, metacognition, and design of classroom atmosphere. In Biology and Psychology classes, we saw statistically significant improvement. Further research is required to correlate how specific classroom practices and pedagogies used in this study correspond with academic achievement and persistence.

Keywords: gateway courses, course redesign, transparent teaching, metacognition, classroom atmosphere, improvement science, persistence, retention

Acknowledgments

It is unlikely that I would have ever considered pursuing a doctorate had I not met John Gardner and Betsy Barefoot, at a play, seven years ago. John and Betsy, thank you both for your encouragement, advice, generosity, and mentorship; you are both world-changers. The opportunity to work with Drew Koch and the rest of the John N. Gardner Institute team has also transformed the way I see our education system, and how we might change inequitable outcomes. Thad, thanks for the steadfast partnership in this work; I have profound respect and appreciation for your friendship, work ethic, and wisdom. There are too many people to name who have helped me along this journey, thank you all. Working with so many wonderful people, and having the support of my family, brings great joy and determined purpose to my work for student success.

Thad M. Harrill: I have considered the pursuit of a doctorate for years. My first vice president at Isothermal Community College, Dr. Bob Harrison, was a daily encourager. When I joined Isothermal in 1999, he began telling me I could and should pursue higher degrees. He was a positive influence during my early work in education. Later, my president, Dr. Myra Johnson, saw potential in me and offered opportunities to take on new challenges. She encouraged me and others to seek out ways to improve students' lives and our community. More recently, I have learned a great deal about how to lead organizations from Isothermal's current president, Walter Dalton. President Dalton has modeled a work ethic and focus that has helped me grow and consider how I might also be a significant influence on community colleges in North Carolina. This is not an exhaustive list. There have been numerous mentors, supporters, and friends at Isothermal who have provided advice, correction, encouragement, and listening ears during the last 20 years. I could not have completed this program without my Isothermal family. I am truly blessed and thankful our paths crossed.

A few times in life, if we are lucky, we meet people who make us better. I was fortunate enough to recognize that Brandon Smith was one such person on the first day of orientation in this doctoral program. We became friends early, in the first classes, and have been a team until this day. I appreciate his dedication, work ethic, and care for others. He has the capacity and heart to change the world for the better. Thank you, Brandon! You have been a great help to me, and I look forward to the good work we can do together, supporting students and our world for years to come.

My wife Gina has been my biggest fan and supporter since we met. She reveals her character through her actions. It is impossible to describe how much she improves me. She has literally taken on more than a person should in my absence. As a nurse, she has spent her professional career taking care of others. I have been her number one "patient." She has provided the emotional support I needed to continue to believe in myself. I have learned that this kind of belief makes all the difference. Finally, I must thank my daughters, Sydney and Annsley. They have provided much-needed comic relief along the way, and are proud of seeing their dad work so hard for this degree.

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The Disquisition at WCU

The Doctorate in Educational Leadership at Western Carolina University (WCU) is guided by a commitment to "continuous improvement, scholarly practice, collaboration, student-centered decision making, and equity and social justice" (Western Carolina University, 2020, para. 2). The degree program is guided by its membership with the Carnegie Project on the Education Doctorate (CPED). According to CPED, members agree to, "undertake a critical examination of the doctorate in education (Ed.D.) through dialog, experimentation, critical feedback, and evaluation" (Carnegie Project on the Education Doctorate, 2020, para.1). As part of this membership with CPED all Ed.D. students participate in a dissertation in practice, also referred to as a disquisition.

Almost all of the students enrolled in the Ed.D. at WCU are practitioners; each is currently employed in a position of leadership in an educational system. For most students in the program, these educational systems are the local contexts for a multi-semester improvement project that takes the form of a disquisition. The disquisition is intended to be a scholarly research document that specifically focuses on improvement in a local context (Storey & Maughan, 2014). This process allows students to utilize improvement science tools (Langley et al., 2009) to work systematically, and begin improvement projects in their respective educational systems during the doctoral program. The disquisition, while serving as an artifact to demonstrate academic research and writing skills, is fundamentally different from many traditional dissertations. In contrast, a dissertation is typically designed as a study of an issue without focusing on the process and results of an intervention in a specific context (Crow, Lomotey, & Topolka-Jorissen, 2016). The disquisition is rooted in the problems of practice at local institutions and serves as an effort to catalyze change and improvement.

Introduction & Statement of the Problem

Academic achievement, namely graduation from an institution of higher education, has become the ticket to desirable career opportunities leading to improved life satisfaction and economic stability. Indeed, it is increasingly challenging for people to find gainful employment without a postsecondary degree. In 2017, German engineering company Siemens Energy held a job fair in Charlotte, NC. About 10,000 people who were interested in the 800 job openings available at the plant attended the event. Unfortunately, less than 15 percent of the applicants were able to pass a ninth-grade level reading, writing, and math-screening test (Selingo, 2017). Eric Spiegel, former president of Siemens U.S.A., said, "People on the plant floor need to be much more skilled than they were in the past. There are no jobs for high school graduates at Siemens today" (Selingo, 2017, p.1). This example illustrates a significant problem, as well as an opportunity for institutions of higher education aiming to prepare people for the workforce. Historically, technical and manufacturing jobs were available to people with little to no education and such jobs provided a living wage. This is not the case today. A higher level of education and marketable skills are now required for people to enter the workforce (North Carolina Community College System, 2018).

Institutions of higher education must understand their "new" critical role and make both employee competence and program completion attainable. Statistically, degree completion is still one of the best financial and psychological investments a person can make (Parker et al., 2016), yet a large number of students who begin a postsecondary program of study leave empty-handed; and most of the students who leave do so in the first year of study (National Center for Education Statistics, 2018). Those who do not complete programs of study often lack the

knowledge and skills necessary for future job opportunities and may find themselves stuck in a situation that does not improve over time (Buryi & Gilbert, 2014; Brush, 2005). Non-completers may also find themselves saddled with debt levels reaching 51% of their annual income (Schnoebelen, 2013).

For communities, including their businesses and industries, a struggle exists to find a regional workforce with the necessary skills. Rural communities, often hit hardest by economic change, frequently see qualified workers leave in search of higher wages (Rodgers & Rodgers, 1997). About half of students in rural areas leave their hometowns and do not return by age 25 (Gibbs, 1995). Even when students leave towns in search of education or work, they may not find what they are seeking. Program completion numbers appear to be disproportional across student populations. Students identifying as minorities, first-generation college, and/or those who are from low socioeconomic backgrounds are more likely to drop out (Pelavin, 1990; Koch, 2018). Low pass rates in foundational and gateway courses inhibit students from progressing through programs of study. The purpose of this disquisition is to present and analyze an improvement initiative focusing on one factor that can contribute to course, and ultimately, program completion: improved course design and pedagogy in foundational classes.

The Local Contexts for Improvement

During our work in the Western Carolina University Ed.D. Program, we recognized similar problems of practice in foundational courses at our respective institutions: Isothermal Community College (Isothermal) and Brevard College. To learn with and from one another, we opted to develop a Community of Practice (COP) (Wenger, Trayner, & de Laat, 2011) and a Networked Improvement Community (NIC). Wenger, Trayner and de Latt (2011) define a

community of practice as a "learning partnership among people who find it useful to learn from and with each other about a particular domain. They use each other's experience of practice as a learning resource" (p. 9). To design interaction amongst stakeholders, we also drew on the theories undergirding Networked Improvement Communities (NIC). The community should be:

1. focused on a well specified, common aim

2. guided by a deep understanding of the problem, the system that produces it, and a shared working theory to improve it

3. disciplined by the methods of improvement research to develop, test and refine interventions, and

4. organized to accelerate their diffusion out into the field, and effective integration into varied educational contexts (Learning to Improve Glossary, 2018, para. 3; LeMahieu, 2015, para 5-8).

Furthermore, we utilized joint meetings and online resources to keep faculty at Brevard and Isothermal in communication throughout the improvement project. Both institutions were actively working on improving student success, and this collaboration seemed like a mutually advantageous endeavor. For this study, Isothermal focused course redesign in Adult High School and Basic Education Courses, while Brevard College focused on 100 and 200 level college coursework.

Brevard College

Brevard College is a small, private school established in 1853. Located in the Blue Ridge mountain range, about twenty years ago, the College became a 4-year institution; until the late 1990s, it was a 2-year school. According to the National Center for Educational Statistics

(2018), Brevard College has historic graduation rates hovering near the 30th percentile. In 2015, the College had a 4-year graduation rate of just 23%, and a six-year rate of 32% (NCES, 2018). Students leave college for many reasons: change of major, lack of money, family demands and poor psychosocial fit (Kuh et al., 2008). We have seen all of these factors at play at Brevard College. As evidenced by our graduation rates, it is clear that we have not been positioned to sufficiently support the needs of all incoming students. In 2015, the College did a study with the John N. Gardner Institute for Excellence in Undergraduate Education (JNGI) called Retention Performance Management. The study identified causal factors limiting student success, but one of the most significant factors was found to be tied to academic success in certain foundational courses. Internal reports indicate that nearly 60% of all courses on the campus in the fall of 2016 had grade rates of D, F, withdrawal, or incomplete exceeding 30% (Downing, 2016). For the last five years, enrollments have hovered around 700 total students, with first-year students regularly making up nearly 300 of that number. Low retention rates have had a significant, negative impact on the annual revenue stream at the College, as well as the broader sense of well-being of the campus community. In 2015-2016, the loss of half of the first-year class equated to about a 25% decline in total enrollment and was a significant blow to the financial health of the College. This kind of annual decline is not sustainable for a school of this size and was a wake-up call for the institution. The Brevard College brand is associated with supportive communities and experiential education, as stated on the College website, "…classrooms are student-centered, not teacher-centered" (Brevard College, 2018). However, a survey conducted by JNGI, as well as personal interviews, reveals that many students do not feel academically supported by the school (Frick-Ruppert, 2014).

High failure rates take a toll on both financial and human capital at Brevard College. Between 350 and 550 individual cases of DFWI grades (which negatively correlate to persistence) occur each semester (Downing, 2016). No instructor wants to feel like he or she is failing students in the classroom, but when students feel they cannot progress in their education, they may get discouraged. In committee meetings, instructors voice their frustrations and feelings of helplessness at being unable to find the right combination of efforts to support the academic outcomes that students require to succeed and persist to graduation. Improving student success in gateway classes is crucial if Brevard College wishes to increase academic achievement, retention rates, and help students graduate.

To that end, the College has been working jointly with JNGI to focus specifically on gateway course redesign since 2014. The process has been iterative, and this improvement initiative has become part of the College's ongoing efforts to increase student success in gateway courses, student retention, and graduation rates. As part of the collaboration with JNGI, Brevard College has been engaged in an ongoing improvement initiative called Gateways to Completion (G2C). The G2C program invites colleges to collect baseline data on student grades, pedagogies, and practice, and then encourage faculty and staff to engage in guided inquiry and redevelopment of courses. Driven by a desire to reduce inequitable outcomes in higher education, G2C invites campuses to reconsider the design and delivery of coursework (JNGI, 2016). A small number of faculty first began attending professional development related to pedagogy with the Gardner Institute in the fall of 2015, and the first cohort of faculty to complete the full three-year G2C cycle will conclude the process in May of 2020. This disquisition is an outgrowth of that work and combines a group of seasoned G2C faculty with a group of newer faculty to continue refining course design and delivery.
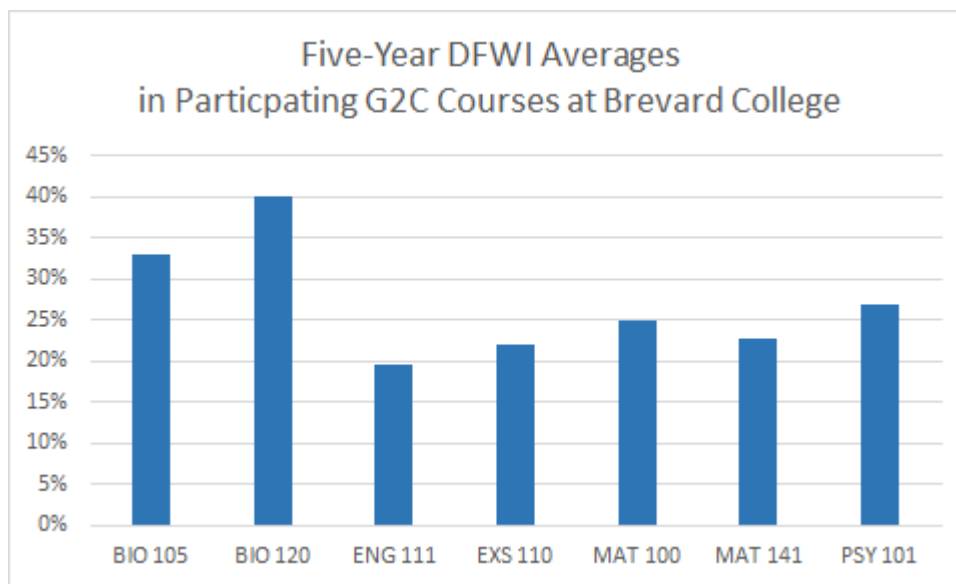
Figure 1. Historical DFWI Rates (2014-2019) at Brevard College Brevard College

All of the courses participating in G2C have historical (five-year) DFWI rates averaging at, or above, 20% (see Figure 1). The Dean and the Academic Leadership Team chose to work on these courses because they have high DFWI rates and some of the highest enrollments on campus. For these reasons, the G2C courses offer an improvement opportunity to faculty and leadership. An increase in student success, and a corresponding decrease in DWFI rates in these courses, has the potential to improve both persistence and completion.

Isothermal Community College

Chartered in 1964, Isothermal Community College was one of the first of 58 colleges in the North Carolina Community College System (NCCCS). We define the college's service area as Rutherford and Polk Counties, which are located in rural Western North Carolina. All community colleges in the state, including Isothermal, are open to anyone wanting access to our programs. In addition to individual courses, the College offers certificate, diploma, and degree programs. Students can either transfer to a four-year institution or use their acquired skills to

find new employment or seek job advancement with their current employer. The College also

provides training for area business and industry, personal enrichment courses, Adult Basic

Education, adult high school, remedial and developmental courses, and community service

activities (Isothermal Community College Website, 2018).

About 42% of students who began at Isothermal in the fall of 2010 graduated from the

college, transferred to a four-year institution, or continued enrollment, having completed 36 non-

developmental credit hours within six years (NCCCS, 2017). Isothermal's graduation rate was

30% at 150% of normal time (NCES, 2018). Only 43% of students enrolled in adult high school

and basic skills programs had measurable skills gain in 2016-2017 (NCCCS, 2016). The Test of

Adult Basic Education (TABE) assesses student skills and knowledge to properly place them in

an adult basic education sequence. It serves as a "litmus test" for both high school and college

readiness (Test of Adult Basic Education, 2019). Students must demonstrate measurable skills

gains, which are equivalent to expected knowledge at grade levels in K-12, to progress through

the ABE program. In part, student success measures involve skills gains and grades. Between

2013-2014 and 2017-2018, there have been 1,174 attempts by students to move up in functional

levels within the ABE program. 522 were successful, while 652 failed. To compare this with

DFWI rates, that is a measurable skills gain failure rate of 55.6% (see Figure 2).
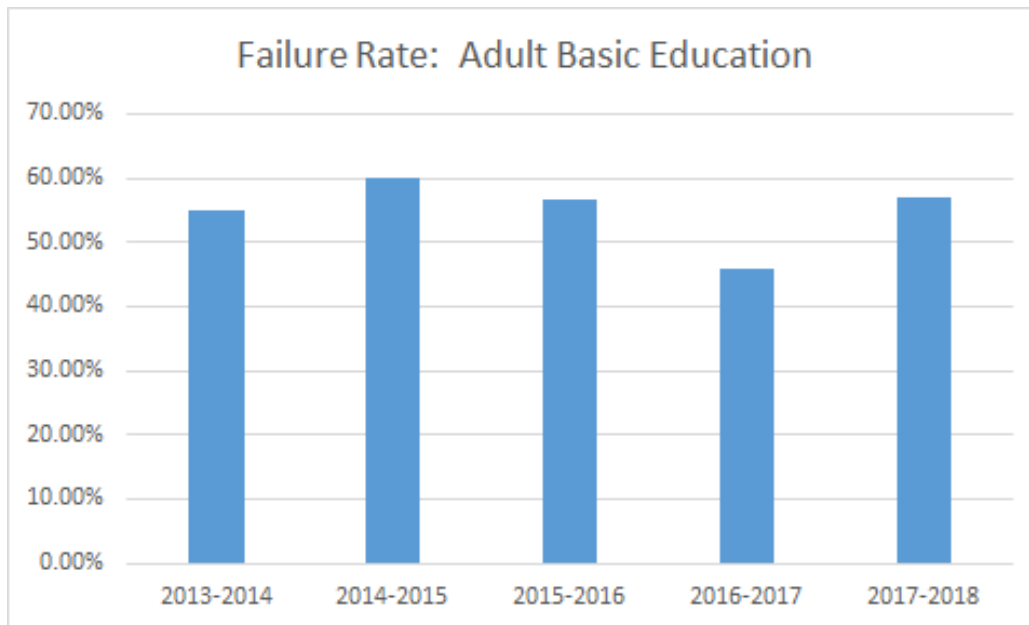
Figure 2. Percentage of Students Not Experiencing Measurable Skill Gains, Isothermal

Those who do experience functional level skills gains are progressing academically towards certificate completion or employment. The DFWI rate for the Adult High School Math 2 class for the 2016-2017 and 2017-2018 was 30.4%, it is worth noting that this course was not taught at Isothermal between 2012 and 2015. Foundational coursework at Isothermal Community College has traditionally presented a challenge for students and has negatively affected graduation rates. Like Brevard, the first year at Isothermal tends to have the lowest rates of retention.

The College mission is, "Isothermal exists to improve life through learning" (ICC, 2018). We measure the effectiveness of all actions, including the creation of new courses or continuation of current programs, by how well the mission is advanced. Like other community colleges, Isothermal is open access (Goldrick-Rab, 2010). Terry Sanford, North Carolina's

Governor in 1964, believed the community college should be "an institution which undertakes everything not being taken care of elsewhere" (Lombardi, 1964, p.8). Isothermal has pursued this ambitious early vision for over 50 years. The College mission upholds that students will obtain increased success, opportunities, and a better life through learning. Through an intentional focus on collaboration and communication, students and faculty take joint responsibility for achieving academic outcomes.

Leonard says, "[T]he time has come to recognize that school is not the solution, it's the problem" (1992, p.26). This is true when our school focus is not squarely on the needs of students. "Putting learning at the heart of the academic enterprise will mean overhauling the conceptual, procedural, curricular, and architecture of postsecondary education on most campuses" (Wingspread Group on Higher Education, 1993, p. 14). The College's last Quality Enhancement Plan (QEP) submitted to SACS-COC in 2014, supports this philosophy, putting the learner first (Oxenreider, McCluney & Capps, 2015). The plan includes a focus on dynamic advising, mandatory new student orientation, and completion of a college success course during the first year of enrollment.

There has been a significant focus on student support outside the classroom at Isothermal, but there is room for system improvement regarding promising practices within the classroom, leading to persistence. The College provides professional development for faculty and instructors throughout the college each year, including adjuncts for the College and Career Readiness Department (Adult Basic Education and Adult High School).

Local Definitions and Terms

This improvement initiative involves three areas of what the authors of this disquisition describe as foundational coursework: Adult Basic Education (ABE) courses, Adult High School, and gateway courses in higher education. In each case, students must satisfactorily complete the coursework, to advance and obtain a degree or certificate. ABE courses are required as a prerequisite to begin Adult High School classes at community colleges in North Carolina. ABE assessment is necessary for those who have not completed high school, and a high school diploma (or equivalent) is required to begin college. At the college level, another barrier awaits many students in the form of gateway courses. Gateway courses are foundational (early in a sequence of study), have high enrollment, and have high numbers of final grades equivalent to D, F, withdrawal, or incomplete (DFWI) (John N. Gardner Institute, 2016). These types of courses tend to have high rates of failure and non-completion, and they frequently act as a significant early obstacle for those wishing to complete their education. For this improvement initiative, we refer to early, high-risk coursework as *foundational courses*, and intend for the term to include both non-credit bearing coursework and gateway college-level classes.

<div align="center">

Initial Causal Analysis

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To understand why students were not passing foundational courses at the college-level, and in ABE courses, we conducted an initial causal analysis of the problem combining the results from Isothermal and Brevard College. Causal analysis is a way to "make visible organizational and structural policies at work" (Bryk, Gomez, Grunow, & LeMahieu, 2015, p. 65). A causal systems analysis diagram, or fishbone diagram, is a graphic visualization tool used to represent organizational challenges linked to a problem of practice. This type of diagram, developed by Ishikiawa (1986), highlights the leading potential causes of a stated problem as theorized by

those using it. The process connects systemic challenges and reveals problem complexity

(Langley et al., 2009). In this section, we provide fishbone diagrams (see Figures 3 and 4) and

brief narrative explanations of the commonly identified causes leading to high rates of failure in

foundational courses at our institutions. The diagrams in this section are the result of a literature

review and talking with the design teams at both colleges. After a deeper exploration of causes,

we chose to focus our efforts on faculty capacity.
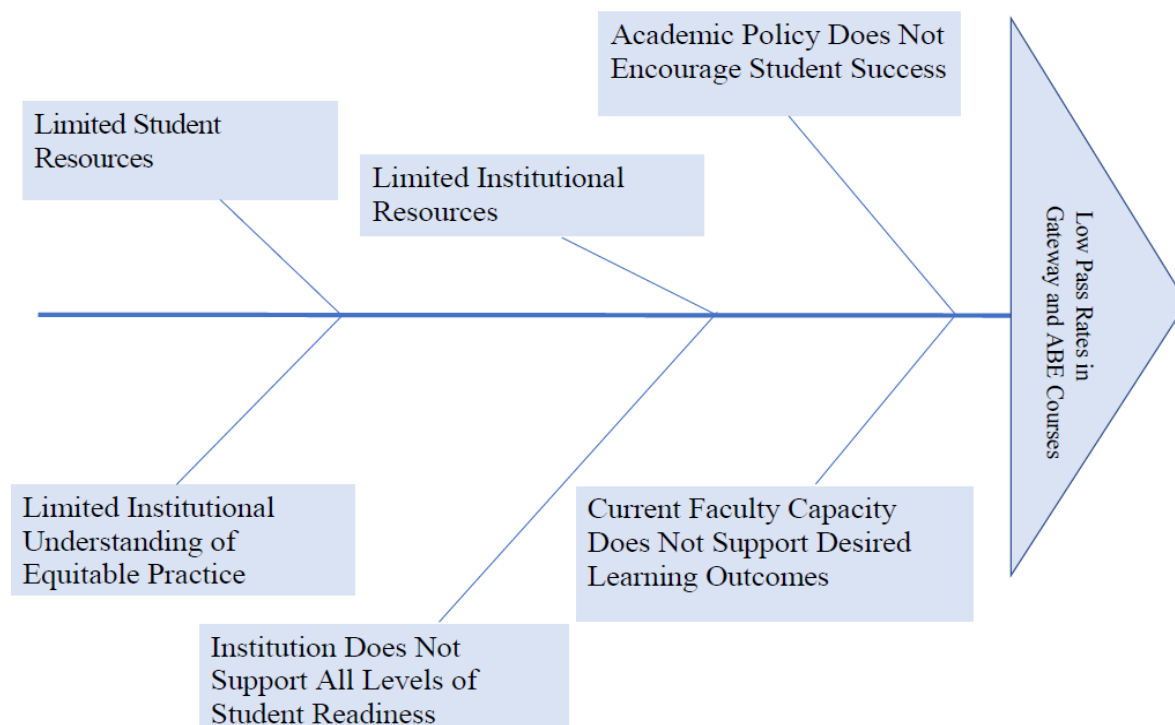
Figure 3. Initial Fishbone Diagram

One factor, among others, found to impact student program completion is the high rate of

end-of-course grades resulting in Ds, Fs, withdrawals, or incompletes in gateway courses

(Downing, 2016; John N. Gardner Institute, 2016; Koch 2017; Twigg, 2003). When students are

unable to complete foundational (pre-requisite) courses, they do not usually advance to other courses and finish programs, degrees, or certificates.

Using collaborative causal analysis, stakeholders at Brevard College and Isothermal Community College worked together to identify six contributing factors to low rates of student success:

- Limited student resources: Students do not always have access to the financial and emotional support required for college completion (Bean, 2005). Books, rent, tuition, and money for basic needs are often in short supply for students. They may also lack a community support structure that contributes to emotional wellness.

- Limited institutional resources: Institutions do not always have the financial and human capital to create systems that will improve academic outcomes (O'Banion, 1997; Wingspread Group on Higher Education, 1993; Langley et al., 2009; Goldstein, Hazy, & Lichtenstein, 2011). College funding structures rarely allow leaders to be reactive to student needs. We build budgets based on an incomplete picture and find ourselves unable to serve students in a given moment.

- Academic processes and policies often do not encourage student success: Many school processes are currently unable to address the complexity of student success. For example, current measures used to place students in foundational courses are not always successful at measuring student readiness, nor at informing the delivery of coursework (Greenfield, Keup & Gardner, 2013).

- Institutions may not operate with an equitable leadership lens. Faculty and staff receive limited professional development necessary to create equitable systems that serve a diverse student body: including course design, the role of deficit ideology, and equitable pedagogical approaches (Gorski, 2011; McBee-Orzulak, 2015). Some of the causal factors listed by stakeholders raise questions linked to deficit ideology.

- Institutions do not support all levels of readiness: Schools may not have resources and systems adequate to support all incoming students. Many college systems are not equitable, nor designed with the needs of diverse learners in mind. The result is that students arrive, but are unable to navigate to successful program completion (Koch, 2017).

- Instructor capacity levels: Instructors may not have the capacity to support student attainment of learning outcomes, which may inhibit satisfactory grades required for course completion (Tinto, 2006). Faculty tend to acquire subject area knowledge during their pre-service education. But continued learning opportunities are rarely offered to build their capacity related to high-impact, and literature-informed instructional strategies and pedagogies (Tinto, 2010).

Although multiple causes potentially contribute, we chose to focus on a single contributing factor: Instructor capacity levels are not sufficient for helping a wide variety of students to complete courses successfully (Tinto 2010). We will address instructor capacity in Gateway and ABE courses since these foundational environments have a high potential to alter a

student's educational path towards completion, or towards an early exit from educational

systems.

All programs of study have foundational courses, and these classes set the stage for future

student success or failure within programs. Whether the DFWI rates are 80% or 20% in one or

more of these courses, faculty and leaders are interested in better understanding the factors that

may impede program completion. We also focused this study on foundational classes because

they have a disproportionately high negative impact on historically marginalized student

populations, such as underrepresented minority groups, first-generation college students, and

students who are Pell-eligible (Koch, 2017; Stephens, Fryberg, Markus, Johnson, & Covarrubias,

2012). Faculty and students often consider these courses to be less critical than upper-level

coursework, and may therefore inadvertently devalue these critical educational opportunities

(Matthews & Newman, 2017). Finally, colleges may not position themselves to build capacity

for the utilization of literature-informed pedagogies and practices within foundational courses.

Without other options, faculty must then rely on teaching methods that do not fully take into

account the needs of students (Koch, 2017; Tinto, 2010).

After identifying our area of focus, we determined the need for a second-level causal

analysis to explore the influences behind insufficient faculty capacity. Analyzing the root causes

of insufficient faculty capacity led the way to potential interventions. There is tremendous

complexity surrounding persistence and graduation rates in higher education, but student success

can often boil down to faculty making incremental adjustments to coursework based on student

need (Chepp, 2017; Daiek et al., 2012; Eliason & Holmes, 2012; Merseth, 2011; Tinto, 2010;

Yamada & Bryk 2016). As an early investigation of the problem, faculty and leadership at our

institutions collaborated on a fishbone diagram. Figure 4 details 13 potential sub-causes (1.0-5.3) leading to low faculty capacity.
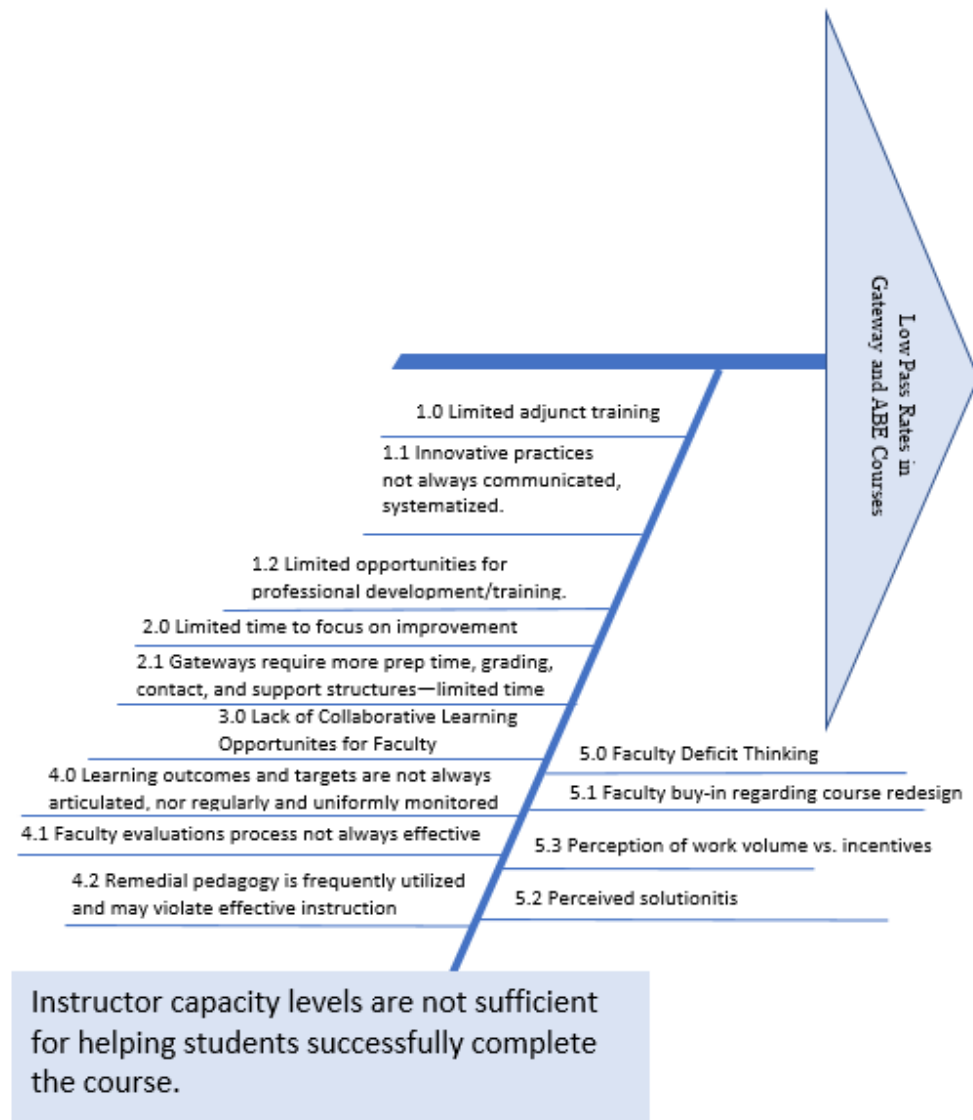
Figure 4. Detailed Fishbone Diagram of Factors Limiting Faculty Capacity

Section 1: Limited Formal Professional Development (1.0, 1.1, 1.2)

In early conversations with faculty at both institutions, they were often unsure of how to support the large numbers of students who come in underprepared, given the limited time and resources available. Tinto states it is "clear that the faculty of our universities and colleges are, as a matter of practice, the only faculty from kindergarten through universities who are literally not trained to teach their students" (2006, p.7). Focusing professional development on student-centered learning and increasing faculty capacity to meet the needs of diverse student populations can have significant benefits for everyone involved in the educational system (Grubb et al., 2011).

Section 2: Limited Resources (2.0, 2.1)

Money and time are always at a premium in the workplace, and faculty often feel pressure related to a lack of space and time (Goldrick-Rab, 2010; Gonzales, Martinez, & Ordu, 2014). Our schools are small, and have limited human resources, which means that initiative exhaustion can be a significant hurdle when considering an improvement effort (Bryk et al., 2015). Faculty working diligently to assist student learning may experience emotional exhaustion or burnout (Skaalvik & Skaalvik, 2014).   Faculty at Brevard College and Isothermal have stated that gateway courses, both major-specific and those in the general education curriculum, frequently require more time spent on preparation, grading, and interaction with students than upper-level coursework (Smith, 2018). In the view of some faculty, especially those who may have multiple gateway courses in a given semester, this additional workload can make it challenging to consider creating time and space to attempt innovative teaching techniques. Budgeting time effectively requires that leaders design systems that consider how work is either put into silos ("differentiation"), or how duties and workload might be

collaboratively redesigned to consider complexity ("integration") (Bolman & Deal, 2016. p.49).

There is also a risk of half-hearted implementation if faculty perceive the work as compulsory

rather than an opportunity to innovate autonomously for reasons they believe are essential (Pink,

2009).

Section 3: Lack of Collaborative Learning Opportunities for Faculty

There is a strong body of evidence recognizing the effectiveness of collaborative learning

as a means of enhancing teaching in the classroom (Barkley, Major, & Cross, 2014; Bosworth &

Hamilton, 1994; Chen, Jones, & Shawn, 2018; Goodsell, 1992; Chaves, & Bittencourt, 2018;

Sharan, 1980; Roselli, 2016; Wennergren, 2016). Collaborative learning is similar to the critical-

friends theory approach to faculty development, where peers offer constructive feedback in an

open and cordial environment (Burke, Marx & Berry 2010). In the book *Collaborative Learning*

Techniques, A Handbook for College Faculty, collaborative learning is broadly defined by

Barkley, Major, and Cross (2014) as learning that involves a group of people, and that is

interactive. Barkley, Major, and Cross (2014) go on to describe this type of learning as pairing

learners in groups of two or more and intentionally inviting them to jointly pursue inquiry to

create a new body of knowledge or understanding. It is often difficult for faculty to devote time

to working jointly on course design at our institutions, and there is currently limited space in the

schedule for this type of workflow (Gonzales, Martinez, & Ordu, 2014). Further limiting factors

include "norms of privacy" which may support "patterns of independent practice" where faculty

do not engage in conversations about challenges or innovations that might impact student

success (Little, 1990, pg. 515)

Section 4: Learning Expectations Not Always Consistent Across Sections (4.0, 4.1, 4.2)

Variations in course delivery, and how faculty prioritize learning opportunities, can affect student success. Students may be underprepared for upper-level coursework when unclear course-level expectations and limited pedagogy pervade the classroom experience (Tinto, 2010). In addition, grades, which theoretically should represent a teacher's accurate evaluation of student performance, often do not reflect student content knowledge or achievement of student learning outcomes (Toledo & Dubas, 2017). Tucker and Courts (2010) assert that grades should represent "student learning and knowledge" (p.48), but posit that grade inflation developing in higher education over the last 100 years make it difficult to align grades and knowledge acquisition. Regardless of a student's ability to meet the learning outcomes outlined in a course, grades may reflect how successful students are at meeting the expectations within a system designed by the instructor. Ideally, grades and learning outcomes are in alignment. However, merely grading assignments is not enough; faculty need to promptly offer meaningful feedback, and all students who complete a class should demonstrate an acceptable level of content mastery (Scriffiny, 2008).

Wide variations in grading practices, which may be unfair, and say little about student achievement and learning, has led to the consideration by some to stop using traditional grading practices (Echauz, & Vachtsevanos, 1995). Scriffiny (2008) recommends that faculty design a feedback system that helps the class better achieve learning outcomes, rather than see students push to make a numerical value or grade. Bill Spady states, "in its briefest form, an outcome is a culminating demonstration of learning" (Brandt, 1992). Outcome-based learning tends to focus on presenting students with high expectations leading to the achievement of learning targets (Lluka & Chunduri, 2015; Toledo & Dubas 2017).   In traditional models of grading, students

face varying measures of their work depending on class or instructor. Subjective grading

practice may result in low grades even when a student is learning content. Conversely, a student

who knows how to play the game of school, may not learn as much but achieve higher grades

(Scriffiny, 2008).

Section 5: Deficit Perceptions (5.0, 5.1, 5.2, 5.3)

Deficit ideology is a quiet specter haunting all educational organizations, including

college campuses. Gorski (2011. p.3) defines deficit ideology as a thought process "based upon

a set of assumed truths about the world and the sociopolitical relationships that occur within it."

Remedial education often focuses on student deficits rather than capitalizing on assets or

acknowledging the fact that nearly all students require some form of assistance during their

college journey (Greenfield, Keup & Gardner, 2013). Many educational systems tend to place

the entire responsibility of learning upon students, rather than considering how instructors and

institutional systems impact learning. Gorski (2011) further posits that we often mistake

differences for deficits; he goes on to say that deficit thinking ignores socio-political contexts

and systems that may impact learners. Biases and preconceived notions influence what people

expect from certain groups, such as race, ethnicity, socioeconomic status, and gender, to name a

few (Gorski, 2011). For example, a member of the faculty could assume a student is not taking

education seriously when they fail to purchase a required textbook for a class. The reality may

be that the student cannot afford the text, unlike more privileged peers. Grubb et al. (2011)

further offer evidence that faculty teaching foundational courses frequently rely heavily on drills

and practice that are not linked to the higher-order application of learning. This "remedial

pedagogy" results in some of the "weakest approaches to instruction" (Grubb et al., 2011, p.3-4)

In extreme cases of deficit thinking a "fixed mindset" can lead to faculty believing that student achievement is not attainable (Dweck, 2014). Faculty deficit perceptions may be the result of a lack of understanding or appreciation of an educator's function to support learning for a diverse student population. In the end, opinions are compelling motivators related to action and outcome within organizations (Pink, 2009). We must periodically investigate our beliefs, attitudes, and values. Such introspection can provide a means of fleshing-out how educators regard students, learning, and success. Every student brings cultural capital to the classroom, and schools must recognize and leverage this valuable resource. A contrast to deficit ideology is an assets-based view of students. By focusing on the assets students bring to college, we can help them achieve success early in the educational process (Hasting, 2016; Samuelson & Litzler, 2016).

Theory of Improvement

Following problem identification, causal analysis, an in-depth examination by both design teams of the problem of low pass rates in our foundational educational contexts, and a preliminary review of the literature, we developed a theory of improvement intended to guide this disquisition. The Carnegie Foundation *Learning to Improve Glossary* (2018) defines a working theory of practice improvement as:

> A small interrelated set of hypotheses about key drivers necessary for achieving an improvement aim and specific changes associated with each driver. It requires a creative blending of observations arising from the causal system analysis with relevant research that bears on this problem together with wise judgments from expert educators (para. 28).

Following our theory of improvement statement, we provide the literature review supporting the use of our proposed improvement initiative.

Our theory of improvement holds that *effective professional development on research-informed pedagogical practices will result in increased efficacy and capacity for faculty teaching gateway and ABE courses leading to improved student academic performance*.
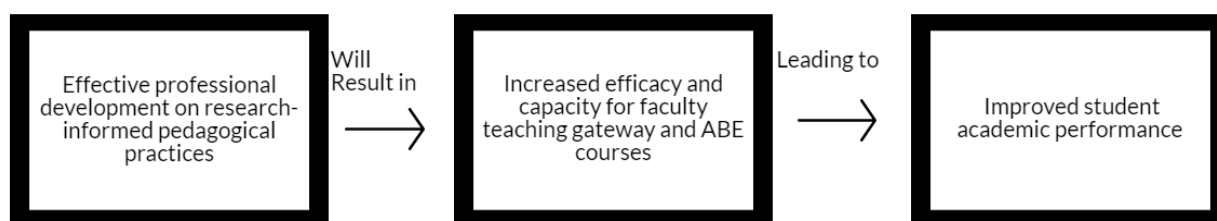
Figure 5. Theory of Improvement Framework

We believe our institutions can increase instructor capacity to implement research-supported pedagogies leading to a decrease in DFWI rates in gateway courses, and a reduction in failures to meet measurable skills gain in ABE courses. Beyond this study, we hope to see a corollary increase in retention, as well as degree and certificate completion. The importance of setting a strong, supportive academic foundation during the first few semesters of college cannot be overstated. There is a growing contingent of scholars who link student success to intentional and engaging pedagogical methods in rigorous foundational courses (Bradford, Mowder, & Bohte, 2016; Broccato, Furr, Henderson, & Horton, 2005; Eckel & Kezar, 2003; Eliason & Holmes, 2012; JNGI, 2016; Koch, 2017; Merseth, 2011; Vanwagoner, Bowman, & Spraggs, 2005; Yamada & Bryk, 2016, Tinto, 2006). This work aligns with the assertion that what matters most for student success in higher education is focusing on teaching and learning in the classroom (Lambert et al., 2016).

Initial Literature Review Supporting our Theory of Improvement and Intervention Design

Prior to meeting with faculty to conduct professional development, we looked for literature to support our theory of improvement. Our scan of the literature focused academic engagement, perceptions and asset-based thinking, course refinement, professional development, collaborative learning. The body of research outlined in this section of the dissertation in practice served as a foundation for the theory of improvement, and we continued to build a body of resources throughout our interactions with faculty. A variety of research-informed pedagogical practices have improved academic outcomes in diverse settings and across student populations (Barkley, 2010; Drinka & Yen, 2008; Schmidt et al., 2010; Twigg, 2003). A good assessment of learning requires an evaluation of both experience and outcomes (Barkley, Major, & Cross, 2014). For content mastery to occur, educators must first define the learning outcomes and then design a learning environment in which students can demonstrate their understanding and application of knowledge. Pedagogies and practices that put faculty and student attention on time-management, study skills, engagement, and reflection on how actions inform outcomes can have a profound impact on overall student success and academic achievement (Daiek et al., 2012; McGuire, 2015; Barkley, Major, & Cross, 2014)

Our current K-12 educational system does not always prepare students for the rigors of college. Goldrick-Rab (2007) reported that 73% of students entering community college, under age 24, scored in the lowest two quartiles of the SAT or ACT. Further, only 22% of students graduating from high school scored at a college-ready level in basic-skill areas. Daiek (2012) and her fellow researchers emphasize that improving foundational and gateway course academic outcomes is an emerging field of study. In short, and this should come as no great surprise,

intentionally designed educational practices that consider the needs of learners can have a profound impact on student success and academic achievement.

Academic Engagement

Kuh and his co-writers (2008) state that there is a positive relationship between student behaviors and organizational environments. Kuh et al. go on to state that exposure to engaging educational practices positively affects all students. However, the net result is more favorable for students entering with less college readiness and students of color; two populations who have historically been marginalized in educational practice. "Student engagement in educationally purposeful activities is positively related to academic outcomes as represented by first-year student grades and by persistence between the first and second year of college" (Kuh et al., 2008, p.555). One challenge in this endeavor, and significant consideration for this dissertation in practice is the identification of purposeful activities that will be both engaging and support the learning that is necessary for the course.

Perceptions: Asset-Based Thinking

All students come to college with varying needs and backgrounds; institutions should both recognize and value diversity. One hope is that educators avoid a deficit ideology, and instead put their attention on developing a culture of asset-based thinking (Hastings, 2016). Hastings also states that building a trusting relationship with students is crucial in the development of a shared culture. Rather than focusing on what is "wrong" with students, educators should find value and improvement by changing systems at their institutions. Samuelson & Litzler (2016) discuss an asset-based approach to cultural development with

students of color who were studying engineering. They link the development of a community of

cultural wealth directly with persistence and achievement.

All students bring cultural capital to college; it is the responsibility of each institution to

recognize and build upon these assets in a systematized way within courses and the broader

college environment. If we fail to consider the diversity of our student values and experiences in

the design of coursework, then we fail to make that coursework relevant and transferable to their

lives. It is clear that student perceptions are formed early in their college education, and that

developing cultural wealth through an asset-based lens can benefit student success. Colleges and

universities should be intentional about crafting practice and curriculum delivery in foundational

courses and consider how community and classroom design may influence student perceptions

and motivation.

Course Refinement

"Nowhere is academic support more critical for student retention than in the classrooms

of the campus" (Tinto, 2010, p.62). In classes ranging from topics in writing (Broccato et al.,

2005) to mathematics (Merseth, 2011; Yamada & Bryk, 2016), researchers have shown that

defining course goals, clarifying learning targets, considering engaging delivery methods, and

scaffolding content development have a positive impact on academic outcomes (Kuh et al.,

2008). Students and faculty spend most of their time together in the classroom; it is, therefore, a

logical place to consider refining practice. Academic support from faculty is most impactful

when connected to things happening within the classroom. Based on this notion and as part of

our preliminary research before initiating an intervention, we developed a list of promising

practices in (see Appendix A) to guide our conversations with stakeholders and to inform the design of our professional development linked to this improvement effort.

Professional Development

Eckel and Kezar (2003) conducted a study investigating institutional change strategies. During the improvement project, they identified strategies to improve student learning, one of which is staff development opportunities. For change to be lasting, institutional culture and thinking must be altered (Gioia & Thomas, 1996). Colleges who participated in Eckel and Kezar's 2003 study created professional development programs for new instructors. They also had informal, round-table type discussions to keep the focus on the ongoing development of teacher skills. A key strategy to professional development being successful "is [to keep the focus] as much about ideas and thinking as it is about action" (Eckel & Kezar, 2003, p. 16). Desimone et al. (2002) found that professional development focused on instructional practices increased the use of those practices in the classroom. Their findings "suggest that change in teaching would occur if teachers experienced consistent, high-quality professional development" (Desimone et al., 2002, p. 105). However, in general, many schools do not have a coordinated development program that leads to a consistent application of pedagogical practice (Desimone, 2002). According to Tinto: "Two areas, among many, that are ripe for exploration, are the effects of classroom practice upon student learning and persistence and the impact of institutional investment in faculty and staff development programs on those outcomes" (2006, p.7).

Collaborative Learning

A study by Eliason and Holmes (2012) details the development and implementation of a

faculty-driven course redesign camp. The purpose of the camp was to educate faculty on

strategies that promote increased teacher efficacy. In part, the model used for the camp utilizes

Barr and Tagg's (1995) notion that faculty and students should work together to facilitate

learning. Students (in our case, faculty) should be active participants in the learning process

(faculty development). The team noted the following benefits of collaborative professional

development:

- It helps teachers gain pedagogical knowledge

- Teachers are encouraged to consider strategies that make them more
  effective

- It allows collaboration with other teachers

This course redesign camp led to a change in the way faculty approached their role as

instructors, as well as the increased implementation of engaging teaching practices. The article

supports the idea that instructors may have limited experience in pedagogical knowledge.

Further investigation in this study listed that "faculty may benefit from discussions on the use of

open-ended assignments, flexible course grading strategies, and the development of syllabi

policies" (Eliason & Holmes, 2012, p.4).

When considering gateway course redesign, one subset of collaborative learning, called

cooperative learning (Barkley, Major, & Cross, 2014; King, 1993; Sharan, 1980), is of particular

interest as it relates to both faculty development and student learning in the classroom. While

some authors use the terms "collaborative" and "cooperative" synonymously, several theorists

prefer to delineate between these two pedagogies. Cooperative learning is often associated with

a social constructivist view of education and the creation of new knowledge and ideas. This

position holds that human beings create cultural meaning and knowledge in groups. Through the

highly intentional design of learning opportunities, this theory posits that we should see an

increase in innovative thought (Barkley, Major, & Cross, 2014; Goldstein, Hazy, & Lichtenstein,

2011) by grouping faculty during the development process. Collaborative learning may be

useful in course improvements as a means of stimulating group innovation, independent thought,

and action within individuals. Putting instructors together to innovate around problems of

practice in foundational courses is a crucial consideration for professional development aimed at

improving academic outcomes. Generally, instructors are experts regarding both content and

their classrooms, and they have insider knowledge regarding the complexity of their

environments. To create an authentic improvement initiative, faculty input in creating new

knowledge was essential to the creation of both professional development content as well as the

construction of manageable data collection protocols.

Improvement Initiative Design and Process

In this section, we outline our process for moving from a theoretical framework to

interactions with our community of practice. This highly collaborative process began with

engaging a design team on each campus and then bringing together common problems of

practice to better understand how we might improve systems. The next steps involved

developing drivers of change and a timeline for the improvement initiative. The initial planning

outlined in this section occurred prior to engaging with our full participating faculty cohort. This

planning phase set the foundation for the faculty-based NIC that would later participate in the course refinement process.

Theoretical Framework

This improvement project focused on organizational learning as a framework for improvement. We utilized a Community of Practice to unite our institutions through a learning partnership to expand our organizational learning (Wenger, Trayner, de Laat, 2011). Organizational learning treats the assessment of a program, or in this case, an improvement project, as a collaboratively designed social activity (Preskill, 2016). The social activity in this context is the improvement of academic outcomes in foundational courses. Argyris (2003) investigates the perpetuation of unjust systems within organizations. He posits "that learning occurs when understanding, insight and explanations are connected with action (Argyris, 2003, p.1179)". To overcome persistent problems of practice, ongoing self-reflection at both the organizational and individual levels are advantageous. Schon (1983) suggests "not only that we think about doing, but that we can think about doing something while doing it" (p. 54). Essentially, an organization can have embedded improvement initiatives that are being revised and executed nearly simultaneously.

Design Team

Both institutions have design teams that included members of the faculty, administration, deans, and directors. Although two different colleges conducted the improvement initiatives collaboratively, strategies were similar, and the two teams communicated as a larger Networked Improvement Community (NIC) (Goldstein, Hazy, & Lichtenstein, 2011). Bryk et al. (2015) say that a NIC brings together systems like people and technology to innovate and support group

learning in a concerted effort. Given the makeup of Isothermal and Brevard College, this study

sought to yield insight on the impact of an intentional redesign of engagement points with

students enrolled in adult high school and four-year higher education programs. The design team

had the unique opportunity to compare the results of similar interventions across diverse student

groups.

Driver Diagram

For this improvement initiative, our aim during the fall semester of 2019 was to increase

student success in foundational courses at Isothermal and Brevard College. Key measures

include decreasing the rate of DFWI grades in gateway courses at both colleges, as well as

increasing educational functioning levels in ABE courses at Isothermal. The monitoring and

design of this effort utilized improvement science tools (Langley et al., 2009; Bryk et al., 2015)

specifically, fishbone diagrams, driver diagrams, and Plan, Do, Study, Act cycles of guided

inquiry. Our primary intervention related to the administration of professional development

designed to build faculty capacity to increase the use of research-informed practices and

pedagogies in foundational courses. Our hope was to increase student engagement, build value

related to coursework for students, and create a classroom atmosphere focused on the individual

needs of students. The driver diagram shown in Figure 6 highlights in green the path from our

change ideas to secondary and primary drivers and finally, to the desired aim of this

improvement initiative.

| OUTCOME MEASURE/AIM | KEY/PRIMARY DRIVERS | SECONDARY DRIVERS | CHANGE IDEAS |

Decrease end of course grades of DFWI in Gateway and Foundational Courses, and Failure to meet Measurable Skills Gains in ABE

Increased Use of Effective Learning Strategies

Student Content Mastery

Increased Student Engagement

Building capacity in faculty linked to effective learning strategies from literature

Use milestones to measure achievement of learning outcomes early in the semester to allow time for targeted improvement.

Use intentionally designed assignments to increase student engagement around coursework

Student and faculty beliefs/perception linked to academic potential in gateway courses.

Dedicate Resources (human, time, fiscal)

Networked Information Communities working between multiple institutions will share effective practice

Expand faculty training and orientation linked to Effective Learning Strategies (including adjuncts)

Survey students and faculty at intervals regarding course-level changes

Use IS tools to understand stakeholder needs

Professional Development—Measured after PD via survey Qualtrics

Improve evaluation of instruction linked to student outcomes

Design system to support Collaborative and Cooperative Learning for faculty

Update Release-Time/Pay Structure

Increase Access to Online Faculty Resources Available

Update Syllabus to Reflect Improvements

Figure 6. Initial Driver Diagram

The driver diagram is a tool to help organize targeted changes thought to lead to the desired outcome (Bryk et al., 2015; Langley et al., 2009). At the beginning of a driver diagram, practitioner researchers should declare a "measurable improvement aim". In our case, we hope to see a statistically significant decrease in end-of-course DFWI rates in gateway courses when compared against five-year averages. Similarly, we hope to see improved rates in ABE students' achievement of functioning level gains, when compared against historical five-year data.

The next step in designing and using a driver diagram is the identification of a small number of improvement ideas, called primary drivers. "In essence, the primary drivers are a network's best initial bet about what to target in the context of the causal system analysis" (Bryk et al., 2015, p. 74). Then, researchers must set more specific improvement interventions called secondary drivers (Bryk et al., 2015; Langley et al., 2009). These secondary drivers activate the change ideas influencing the primary drivers. Finally, moving from the general to more specific, individual change ideas make up the final column on the diagram. As knowledge grows, changes made in a system will either be supported by evidence, or not, and will suggest adoption or adaptation of the changes (Langley et al., 2009).

The driver diagram in figure 6 illustrates our belief that building capacity in faculty through professional development linked to effective learning strategies (change idea) will better position them to refine course delivery and teach the curriculum in a more effective manner (secondary driver). We hope that this opportunity will lead to increased use of effective learning strategies in the classroom (primary driver).

The Improvement Initiative: Professional Development for Faculty Teaching Foundational Courses

All faculty should have access to high quality and ongoing professional development (PD) opportunities (Eckel and Kezar, 2003). Course redesign efforts at Wallace Community College illustrate how pedagogical changes significantly increased learning outcomes and degree completion. Educational reforms using promising practices at this college led to completion rates increasing by 67% in just a few years (Brownlee, 2017). We believe that completion is one result of student success in the classroom. With this in mind, we proposed that a small group of faculty from both colleges and a select group of other campus stakeholders assemble to review and identify promising practices for gateway course redesign aimed at increasing instructor capacity to meet student-learning needs. We further suggested consideration of promising practices tied to the professional development of our adjunct faculty. These part-time teachers instruct a significant number of gateway courses and thus spend much of their time interacting and guiding students.

Faculty Participants

Participants in this improvement process came from the G2C cohort of faculty at Brevard College. The group included faculty from foundational Math, English, and Biology courses, and has recently added Psychology and Exercise Science classes to the committee. At Isothermal, leadership has invited faculty from the ABE and adult high school (Math 2) programs to participate in the improvement initiative.

Improvement Initiative Action Plan and Timeline

Beginning implementation of the foundational course redesign initiative started upon review of our proposal by doctoral program faculty and the approval of the Western Carolina University's Institutional Review Board (IRB). Consent forms were completed and collected from faculty and students before participation in the initiative. The initiative was blinded, and no identifying data were collected that will link back to individual research participants before, during, or after the improvement initiative.

Timeline

Our timeline for implementation of this improvement initiative was as follows:

Spring 2019	PDSA 1: Engaged with design team, faculty and staff to discuss the causal factors linked to high DFWI rates and failure to meet MSG in ABE courses.
January 2019	Initial literature review of the problem and promising practices
February-March 2019	PDSA 2: Improvement Science workshop with faculty who opted to engage in the study. We asked stakeholders to further isolate problems of practice, drivers of behavior, and refine the operational model of improvement
April-July 2019	Multiple meetings with participating faculty to conduct professional development on promising practices, system refinements, and initiative timeline

July-August 2019	Built online resources to support the faculty Networked Improvement Communities (NIC) (Goldstein, Hazy, & Lichtenstein, 2011).
August-December 2019	PDSA 3: Conducted pilot of the improvements in gateway courses. Encouraged faculty to engage collectively regularly during the semester to discuss challenges and innovations. Measurement of formative and summative grades, learning outcomes, and perceptions were measured at intervals
December 2019	Administered faculty end-of-initiative survey; finalized data analysis, and disquisition submission

Evaluation of Improvement Process

In this section, we considered the broader goals of our initiative by answering Langley et al's three questions guiding improvement. Using those questions, we then developed a series of formative measures. These early and mid-semester measures allowed us to track the progress of the initiative. Our summative measures involve comparing historical grades to the end of course grades in the participating courses, and then comparing pre-initiative and post-initiative survey results from faculty and students.

Three Guiding Questions

The model for improvement used in this disquisition utilizes Langley et al.'s (2009) three questions for guiding improvement:

- What are we trying to accomplish, and are we achieving our goal?

- What changes can we make that will result in improvement?"

- How will we know that a change is an improvement?

These questions served as guideposts leading the improvement methodology in foundational courses on our campuses. The questions also "scaffold[ed] a learning dynamic" (Bryk et al., 2015, p. 114), where the focus was placed on understanding the problem, identifying change ideas, testing the change, and reporting results. The next section of this improvement project will outline the 3 formative and 1 summative assessment points utilized in the study. The evaluation methodology for this improvement project used "quasi-experimental, time-series design" because we do not have control groups, and we will be collecting data from subjects before, during, and after the initiation of a systems change (Preskill, 2016, p.113).

Practical Measurement and Formative Assessment

The Carnegie Foundation defines practical measures as a way to assess changes, predict outcomes, and set priorities for practitioner researchers (Bryk, Yeager, Muhich, Hausman, & Morales, 2013). Practical measurement further seeks to collect data through application of drivers of change in order to refine and improve educational systems. Table 1, below, we describe the formative and practical measurements utilized in this study.

Table 1
Outline of Formative Measures

Date	Guiding Question	Type of Measure	Data Collection	Frequency	Data Analysis Strategy
August-December, 2019	Did faculty log milestone assignments on time? PROCESS Confirm course changes are delivered and tracked via spreadsheets. Check for worksheet compliance.	PROCESS Confirm course changes are delivered and tracked via spreadsheets. Check for worksheet compliance.	Online Qualtrics	At intervals (2-4) defined by faculty	*Quantitative* Was a promising practice in the classroom applied and tracked? Tracked with a bar chart
Midterm, fall semester, 2019	*Is it working?* Are grades satisfactory (as defined by faculty) at midterm? Note: This measure does not apply to ABE courses.	DRIVER Grade Check	Midterm Grades	Midterm	*Quantitative* Chi-Square Analysis
Midterm, fall semester, 2019	*Are there unintended consequences?* How are participants feeling?	BALANCING Student and faculty perceptions and beliefs linked to new pedagogies and processes.	Surveys for students and faculty (See Appendices D and E).	Before the intervention, at midterm, the end of the semester	*Quantitative and Qualitative* Independent Samples T-test, comments from participants

Process Measure

The change process in this improvement initiative depends on collaboratively delivering faculty development sessions to build faculty capacity in foundational courses. To track the impact of this effort, we utilized milestone assignments that involved the assessment of a significant learning outcome in a course, coupled with the use of research-informed promising practices.

To track this process, we invited faculty to complete milestone development worksheets (see Appendix G) as a means of intentional application of research-informed pedagogical practice in the classroom. We then asked to log milestone results and student achievement of academic outcomes using a Qualtrics-based data collection tool. This tool helped us monitor faculty participation in the improvement initiative. The design of milestone assignments asks faculty to consider Barkley, Major, & Cross' position that assessment of learning requires the intentional design of both experience and outcomes (2014).

Driver Measure

To monitor how the instructional change affected academic outcomes, specifically grades; we tracked midterm grades in the pilot courses where such grades had a historical precedence, and compared them against historical data. We used independent samples t-test to measure the differences in grade averages between the historical course data and the pilot group. A significant p indicates that researchers should reject the null hypothesis. The null hypothesis is "the hypothesis of no difference" (Tanner, 2012, p.160), or that system has not changed in a significant way.

Balancing Measure

To mitigate unintended consequences linked to the pilot, we conducted pre-intervention surveys (Appendices C & D), mid-semester surveys (Appendices D & E), and post-intervention surveys (Appendices E & F) for students and faculty. These data collection tools were nearly identical at each interval and measured participant perceptions linked to the course redesign and delivery process. To ensure confidentiality, we assessed the average score of each question across surveys. We used an independent samples t-test to compare questions linked to engagement and value across the semester. For example, we asked students to rate their engagement in the course from "not engaged" to "very engaged."   The survey also asked students and faculty to rate their perceived importance of a series of teaching practices informed by literature. We desired to see, on average, that positive perceptions linked to the courses and faculty practices in the classroom increased over time, therefore enabling us to reject the null hypothesis, and signal that there has been a change linked to the improvement process (Tanner, 2012). This survey contained questions for faculty and students measured via a Likert-type scale (Olsen, 2012). Questions sought to measure perceptions of foundational courses, the efficacy of pedagogies, perceived learning gains, perceived course quality, and the overall student and faculty perceptions of the course impact as an educational experience.

Summative Assessment

Since there has been evidence that DFWI grades can negatively impact persistence, (Downing, 2016; JNGI, 2016; Koch 2017; Twigg, 2003), we sought to measure the end of course grades and measurable skills gains in ABE courses as an identifier of improvement. Table 2, below, outlines summative measures, which includes comparing end-of-course grades to historical outcomes, and faculty and student perceptions of promising practices in the classroom.

Table 2

Outline of Summative Measures

Date	Guiding Question	Type of Measure	Data Collection	Frequency	Data Analysis
December, 2019	*Did it work?* AIM: Reduce end-of-course DFWI rates in gateway courses, and failure to meet MSG, by building instructor capacity	OUTCOME Historical grades in courses compared to pilot grades	End of Course Grades	Post-Initiative	*Quantitative:* Chi-Square Analysis
December, 2019	AIM: Monitor faculty perception and use of promising practice	Qualitative: Survey Questions	Qualtrics Survey	Post-Initiative	Faculty Survey Responses
December, 2019	AIM: Monitor student perceptions linked to gateway courses	Qualitative: Survey Questions	Qualtrics Survey	Post-Initiative	Student Survey Responses

A chi-square test may be used to calculate if a significant change exists between the historical grades and those reported at the end of this process. A significant $p (\leq 05)$ may support the postulation that the independent variable of course level-changes, informed by promising practices from literature, prompted increased academic achievement in the groups (Tanner, 2012).

In addition to this quantitative analysis, we planned to seek qualitative feedback from stakeholders. We invited students and faculty to comment on their overall experience in the gateway course, asking them to rate practices they thought were extremely effective, and those they thought were less effective.

Plan, Do, Study, Act: The Improvement Initiative in Action

At the core of this improvement initiative is the use of the Plan, Do, Study, Act Cycle (PDSA), a "method of inquiry in improvement research" (Bryk et al., 2015. p. 121). This tool helps groups learn faster and move from "small scale testing to system-wide implementation" (Bryk et al., 2015, p. 121). Each PDSA cycle involves planning activities, initiating a change, gathering and reviewing the results from that change, and finally adjusting practice to support continuous improvement (Langley et al., 2009). Researchers should consider implementing the PDSA framework multiple times within the same initiative to refine the improvement to scale-up with fewer unintended consequences. We implemented 3 separate PDSA cycles. For the first cycle, we worked with stakeholders to design an initial framework for the intervention. Cycle two engaged faculty in professional development opportunities, and the final PDSA followed implementation of new course design.

PDSA #1: Working with Stakeholders to Design the Intervention

The design team, a group comprised of vice presidents and faculty from both colleges,

met multiple times in early 2019 to discuss methodology, the challenges in foundational courses,

and to confirm stakeholder buy-in and institutional support for this improvement initiative.

Figure 7 illustrates an overview of the first PDSA cycle for this improvement initiative.

PDSA 1

February 2019 to March 2019

4. ACT

A. Use the data collected to develop resources to share with faculty

B. Continue building artifacts

C. Begin outlining professional development informed by PDSA 1

1. PLAN

A. Organize and build communication tools, timelines, and set goals

B. Identify gateway courses that will participate in the study

C. Identify problems, causes, and change ideas

D. Share process with faculty

3. STUDY

A. Analyze the fishbone, driver, and surveys

2. DO

A. With faculty, dicsuss the problems of practice experienced in gateway courses and build a fishbone diagram

B. Discuss interventions and innovations that have been successfully used in the classroom, and build a driver diagram

C. Administer pre-survey measuring perceptions of student readiness and potential for improvement

Figure 7. PDSA 1.

Plan

After reviewing historic grade and persistence data at each institution, leadership at both campuses approached potential study participants. At Brevard College, these criteria included foundational courses with five-year average DFWI rates at, or above, 20%. At Isothermal, potential participants included faculty teaching Adult Basic Education courses; less than 50% of students in these classes had measurable skills gain over the last five years. We then invited faculty teaching these courses to information sessions outlining the purpose and activities involved in this improvement initiative. Following this meeting, a group of faculty self-elected to join the improvement project.

Do: A Refined Causal Analysis

On April 9, 2019, we met with the faculty at ICC to discuss problems of practices associated with undesirable academic outcomes in foundational courses. As mentioned earlier, the work at Isothermal focuses on Adult Basic Education (ABE) and improving success rates on the Test for Adult Basic Education (TABE), which measures level gains (grade-level benchmarks) for students enrolled in the program.

After a brief introduction, we invited faculty to discuss the challenges and causal factors related to low success rates in ABE courses. Despite having already created a fishbone prior to organizing this group, we wanted to ensure that the participating faculty had an opportunity to collaboratively identify the causal factors that were specific to their educational context. Using a fishbone diagram as a framework to guide the conversation, we mapped the challenges faculty discussed on a whiteboard. Some of the primary areas of concern included:

- Assignment completion

- Attendance

- Limited student use of the Learning Management System (LMS)

- Basic needs (food, shelter, wellbeing) going unmet

- Syllabi and other systems being underutilized

- Prevalence of Imposter Syndrome

- Study skills are not always well developed

- Faculty and students do not always have a relationship or shared goals

- Students do not always have time management skills

Following this initial investigation of the problem with ICC faculty, we discussed our plan to continue the conversation in a similar meeting at Brevard College. On April 11, 2019, we met with the faculty at Brevard College and mirrored the work outlined above at Isothermal. During this meeting, the faculty voiced many of the same causal factors and challenges that ICC faculty discussed.   Additional causal factors mentioned by the Brevard College faculty included:

- Poor communication between the athletic and academic programs

- Resource navigation is not always intuitive (physical and digital)

- Timely feedback is not always offered to students

We took the results from meetings at both colleges and organized root causes on a refined fishbone diagram (see Figure 8).   We built his new fishbone diagram after considering the causal analysis completed with our design teams (Figures 3 and 4) and clarified the factors that were most relevant to our participating faculty.

Collaborative Fishbone 2019

Primary Drivers
Classroom Atmosphere (CA)
Transparent Teaching (TA)
Metacognition (MC)

Support Challenges

Learning Challenges

Academic Policy Challenges

There are limited PD opportunities for faculty

Study skills, notetaking skills, and expectations are not always understood or made relevant (TT)

Syllabi are not standard. Usage is low for many students (TT)

Professional development is not always tailored to individual needs. (CA, TT, MC)

How learning outcomes connect across classes is not always clear (TT)

Learning outcomes are not always clear (TT)

Some faculty do not keep grades on LMS updated. Students do not know what their grades mean/equate to regarding progress (TT)

Many students fail b/c of non-completion of assignments, or attendance issues (TT, MC)

Limited relationship with students, some faculty don't even know student names

Timely feedback and methods of feedback to students not always effective (TT)

Relevance of coursework is not always clear to students (CA, MC)

Students do not always check or reply to email. Report being overwhelmed by volume (TT, MC)

Classroom practices do not always support learning (CA, TT, MC)

Faculty are not certain about methods to build buy-in with students (MC)

Students often hesitant to participate/ask questions (CA)

Non-completion of assignments causes many students to miss learning targets & fail (CA, TT, MC)

Professors offer significant feedback to students, but students don't always utilize feedback (TT, MC)

Student actions do not always support desired academic outcomes (MC)

Imposter Syndrome: Students do not believe success is possible (MC, CA)

Assessment models do not always lead to improvement because relevance to larger aims is unclear (TT)

Student Challenges

Faculty/Instructor Practices

Problem of Practice: Low Pass Rates in Gateways and ABE Courses

Figure 8. Refined Fishbone Diagram

In addition to the fishbone, we decided to create a three-column chart (see Figure 9) designed to highlight the similarities in the conversations held at the two schools. We shared these frameworks with faculty before our next meeting to confirm stakeholder inputs and gain consensus quickly. During these initial meetings, faculty focused on student deficits. Such as lack of preparedness, poor study skills, and failure to complete assignments. The phrases often began with "*students* do not….", with a focus on student behavior rather than on how systems were not supporting student learning. This lens would eventually shift for many study participants to a belief that faculty behavior and instructional design could alter systems to better support student learning.
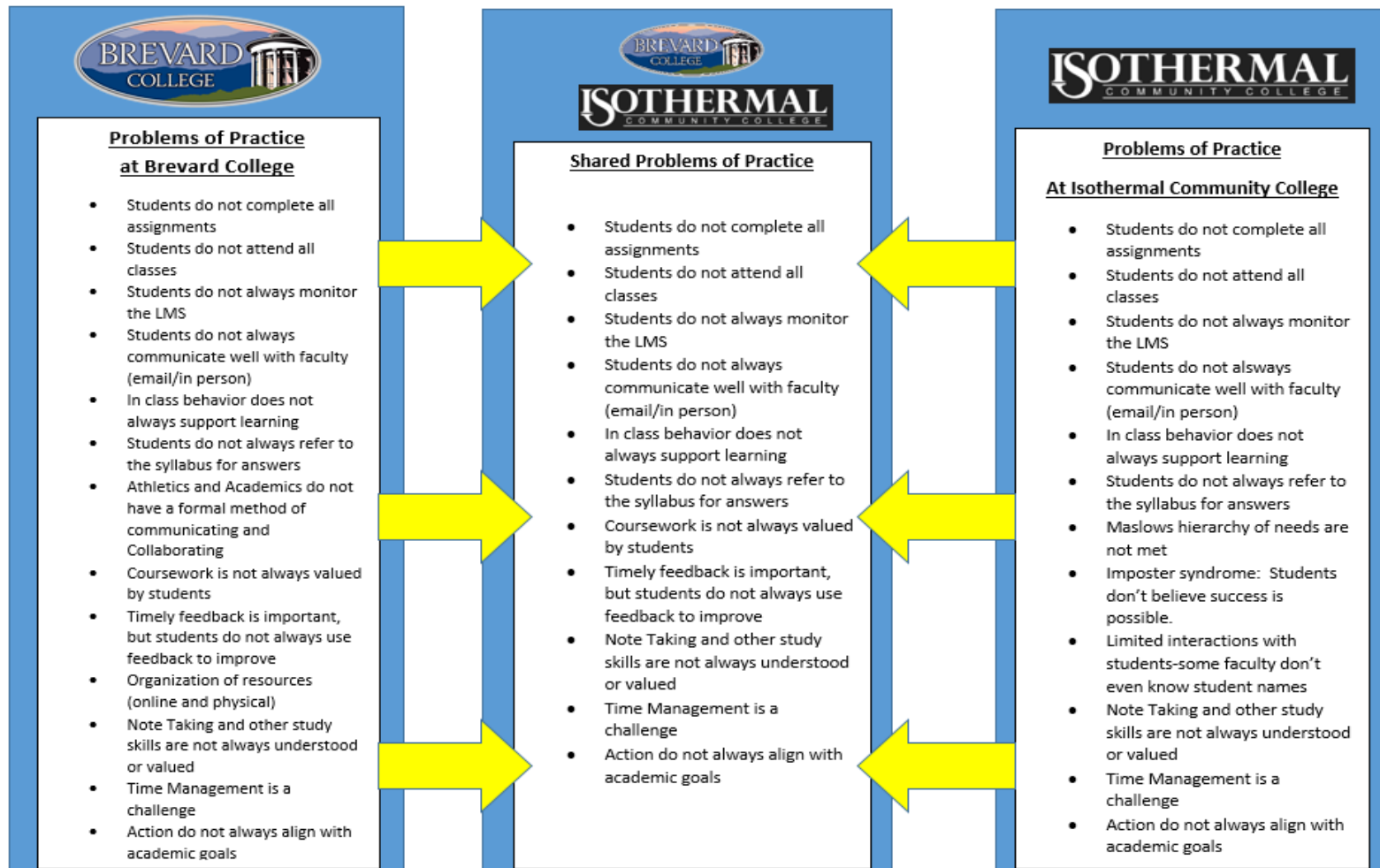
Figure 9. Three Column Chart Outlining Shared Problems of Practice

In late April, we met with faculty again to confirm our list of causal factors and discuss how this effort might drive change and improvement in classes. During the conversations, it was clear that students do not always make the connection between what they say they want in a class and the amount of effort it will take to achieve those goals. Some students do not make class attendance a priority. Faculty expressed their expectation that students need to spend time outside of class working on classwork. The groups noted that lack of proper time management was as a barrier to student success. At this point in the conversation, the faculty primarily focused on student actions (or lack thereof) as an inhibiting factor limiting student success. At times, the conversation veered towards deficit ideology.

As a transition point, we asked faculty to look at the causal factors in front of them and discuss in small groups why these factors persist. To guide this conversation, we used the *Five Whys* method of inquiry (Moaveni & Chou, 2016). The Five Whys invite people to dig into the root causes of an issue by asking *why* something is a problem, then asking *why* the resulting answer is a problem. The process repeats five times and often leads to new understanding and perspective associated with how systems interact. This conversation was a significant turning point for the group: Faculty started to move from focusing on students' shortcomings (characteristics) to becoming aware of the underlying root causes and how faculty action, pedagogy, and practice might impact student outcomes. There was an air of excitement in the room, and after the exercise completed, we began a conversation about drivers of improvement and change. We then sketched out a driver diagram, and we promised the faculty a finalized digital version before the next meeting.

Refining the Driver Diagram and Collectively Building Professional Development.
Following the second faculty meeting, we refined our driver diagram. The following diagram
(see Figure 10) focuses on three key areas: classroom atmosphere, transparent teaching, and
metacognition. The faculty agreed that these primary drivers would be the focus of our
initiative. We then organized these categories of change, or primary drivers of change, into
literature supported activities on which faculty can focus milestone assignments and course-level
changes. There were 11 secondary drivers, which focused on actions that faculty and students
could take the classroom to support learning. Finally, the 12 change ideas, on the far right of the
diagram, specify the tools, pedagogies, or practice that faculty could employ to drive the
secondary and primary drivers.

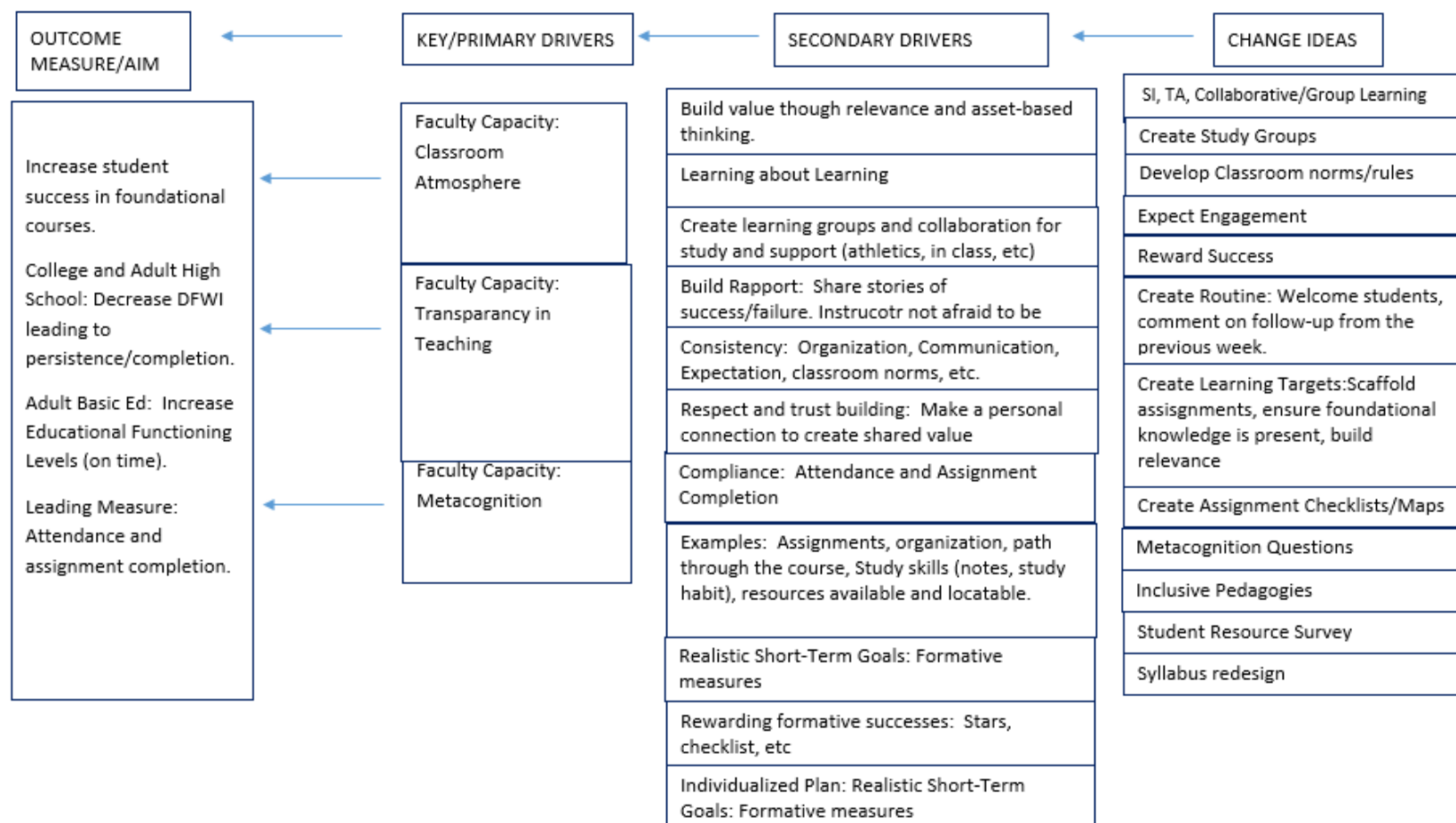| OUTCOME MEASURE/AIM	KEY/PRIMARY DRIVERS	SECONDARY DRIVERS	CHANGE IDEAS
Increase student success in foundational courses. College and Adult High School: Decrease DFWI leading to persistence/completion. Adult Basic Ed: Increase Educational Functioning Levels (on time). Leading Measure: Attendance and assignment completion.	Faculty Capacity: Classroom Atmosphere Faculty Capacity: Transparancy in Teaching Faculty Capacity: Metacognition	Build value though relevance and asset-based thinking. Learning about Learning Create learning groups and collaboration for study and support (athletics, in class, etc) Build Rapport: Share stories of success/failure. Instrucotr not afraid to be Consistency: Organization, Communication, Expectation, classroom norms, etc. Respect and trust building: Make a personal connection to create shared value Compliance: Attendance and Assignment Completion Examples: Assignments, organization, path through the course, Study skills (notes, study habit), resources available and locatable. Realistic Short-Term Goals: Formative measures Rewarding formative successes: Stars, checklist, etc Individualized Plan: Realistic Short-Term Goals: Formative measures	SI, TA, Collaborative/Group Learning Create Study Groups Develop Classroom norms/rules Expect Engagement Reward Success Create Routine: Welcome students, comment on follow-up from the previous week. Create Learning Targets:Scaffold assisgnments, ensure foundational knowledge is present, build relevance Create Assignment Checklists/Maps Metacognition Questions Inclusive Pedagogies Student Resource Survey Syllabus redesign

Figure 10. Revised Driver Diagram, Developed by Participating Faculty.

Once we finalized the driver diagram, we engaged two members of the Education

program at Brevard College in our discussion of change ideas. They offered input and agreed

that the language, theory, and resources we had listed in the driver diagram would support the

theory of improvement. One extremely useful reference they offered related to two

metacognitive theorists: Dr. John Flavell and Dr. Saundra Maguire. The result was a list of

resources and articles on which to base our faculty development session, which we combined

with two guest-speakers, one on metacognition, and the other on universal design syllabi.

We spent the next few weeks organizing resources for professional development.

Resources prepared for the faculty development session included:

- An updated timeline

- A shared digital file of useful articles

- Revised copies of the fishbone and driver diagram

- A change idea reference page (see Figure 11)

- A sheet with shared problems of practice (see Figure 9)

- Milestone planning worksheets (Appendix G)

- An online digital workspace to house all resources

As a group, we continued to discuss the problems of practice and challenges surrounding

foundational courses, interventions, as well as creating timelines and setting goals. We

administered pre-intervention survey to measure faculty perceptions related to student readiness,

promising practice, and dispositions (See Appendix D). Prior to the intervention, 36% of faculty rated current student engagement as high within their courses. The survey yielded insight into how faculty ranked the following practices as most significant to student learning. These were, in order of from highest to lowest: frequent feedback, setting clear expectations, office hours to review class materials, classroom setup, peer support, and teaching self-regulating behaviors. Finally, in an open-ended portion of the survey, the faculty listed important considerations for student success in foundational courses. They explained that developing a rapport with students, their willingness to consider student suggestions, student attendance, study skills, and proficiency using the LMS was important. All of this discussion and feedback informed the development of our professional development process.

Study

To focus our professional development, we looked to literature and pedagogues on our campuses to find pedagogy and practice that might have a positive influence on causal factors identified by participating faculty. One of the challenges we faced was organizing the changes ideas into a set of primary drivers. With the assistance of participating faculty, pedagogues, and information pulled from literature, we categorized the professional development into three primary drivers of change: Classroom Atmosphere, Transparent Teaching, and Metacognition.

For the purposes of this disquisition, classroom atmosphere relates to the intentional design of classroom interactions, and developing supportive relationships between faculty and students that improve student achievement of learning outcomes. On our campuses, the classroom is the primary space where teaching takes place and faculty in our study focused on change ideas that related to what happens in the classroom. Barkley (2010) reminds us that a

supportive environment can have a profound impact on learning. Change ideas that fall under

the primary driver of transparent teaching invite instructors to design relevant rationale and

conversations for assignments and activities (Winkelmes, 2013). The final primary driver that

faculty were offered professional development on, Metacognition, was described by Flavell

(1979) as an investigation of the process of learning. It is a method for teachers that can be used

to make the process of learning more visible to students. The focus of all of these drivers is to

make visible the opportunities, paths and processes or learning in classroom.

Figure 11, below, is an artifact that was used as a reference during our professional

development process. This Change Idea Reference Page outlines each of the primary drivers in

this improvement initiative and lists possible course-level change ideas from literature and

faculty experience that were identified as supporting student learning.

Classroom Atmosphere

Checklists for expected behaviors for each class

Have you reviewed notes, assignments, intention for the class period?

Teaching Assistant/Peer Mentor/Supplemental Instruction to model and monitor behavior (peer learning)

Building norms in early in the semester

Create ideas/rules/etc.

Clarifying expectations (student/faculty) full-value contract (Learning and Engagement Contract)

Review goals often

Reward Attendance

Encourage students to value the formative assignments

Personal connections meeting with student, meeting outside of class, consider reviewing learning contract (update, modify, check-in)

Early in the semester-build trust, encourage questions

Building relationships: Faculty/Peer Leader ask, "How is it going outside the classroom"

Faculty paying attention and then asking about specifics--making time to do this in class

Developing a personal connection early, taking notes and remembering specific things about that students experience

Study Groups

Classroom routine/ritual: starting/ending, reliable frameworks students can expect.

Keep the focus on learning, not grades

Transparency in Teaching

Accessible Syllabi:

Image: this can create more appeal. Not just words. The better example….pictures, table of contents, "What students say about this class"

In addition, have a "text only" version and consider columns.

Text: Make it possible for students to adjust text, think about text and font color

Rhetoric: Using positive over punishing language. Students tend to forget when punishing language is used, use inviting language; teacher will have to choose language depending on situations, use cooperative versus paternalistic language

Learning Outcomes/Targets and Understanding

Foundational Knowledge: Does the student have, or have access to foundational knowledge/resources? How will you know?

Target and Scaffolding: Does the student have a target or example for application and integration of foundational knowledge?

Relevance: Is there a human dimension? Have you discussed why this work matters to the student on an individual level?

Assignment Choices: Value added when an instructor gave students alternative assignments that led to the same learning outcomes.

Assignment Checklists

Inclusive Pedagogies: Student Resource Survey

Transparency & Metacognition

Implementing Metacognition in the classroom--See attachments from Tanner, 2012

Self-Evaluation Rubrics completed prior to assignment due date

Sample/example papers that allow the student to see a clear example of application. Consider breaking these into component parts.

Breaking down steps for assignments--helping them understanding the actual problem and how to apply the information provided to the assignment.

Intentional conversations, modelling, scaffolding from instructor and student (breaking the assignment into component parts), time management embedded into the assignment

Reflection: Building time into each class for reflection on learning and process.

Exam wrappers. Asking the student WHY results occurred, and invite them to redesign study process.

Figure 11. Change Idea Reference Page

Act

To facilitate the creation of professional development materials and make change ideas more easily navigable by faculty, we utilized the Change-Idea Reference sheet (see Figure 11). This tool allowed us to review change ideas quickly and categorized them into one of the three primary driver "buckets." This page served as a reminder to faculty as they created milestone assignments in their classes.

The next step in the process involved researching additional literature informed pedagogy and practice and working jointly with Education faculty at Brevard College to develop content (slide shows, guest speakers, digital resources, and handouts) for the next professional development meetings. The results of PDSA 1 led to the creation of a two-hour professional development session that involved the entire participating faculty meeting face-to-face for the first time.

PDSA #2: Faculty Professional Development

The second professional development session built on the data collection from the first PDSA cycle. After engaging with faculty, we realized that we wanted to further develop our body of literature to more specifically meet the needs of study participants. This is an example of the kind of pivot that improvement science is designed to support, one that is informed by rapid cycles of inquiry. Rather than making changes to an improvement design post-initiative, the PDSA cycle allowed us to refine our processes sooner, and thus better serve our participants. This second PDSA focused on additional research of promising practices from literature, informed by faculty input, to drive course-level change. We built online data collection frameworks using Qualtrics during this time, as well as online resource drives for faculty. We

wanted to build a digital hub for our NIC interactions. After consulting with pedagogues at

Brevard College, we synthesized the research into a two-hour professional development session.

Figure 12. PDSA 2.
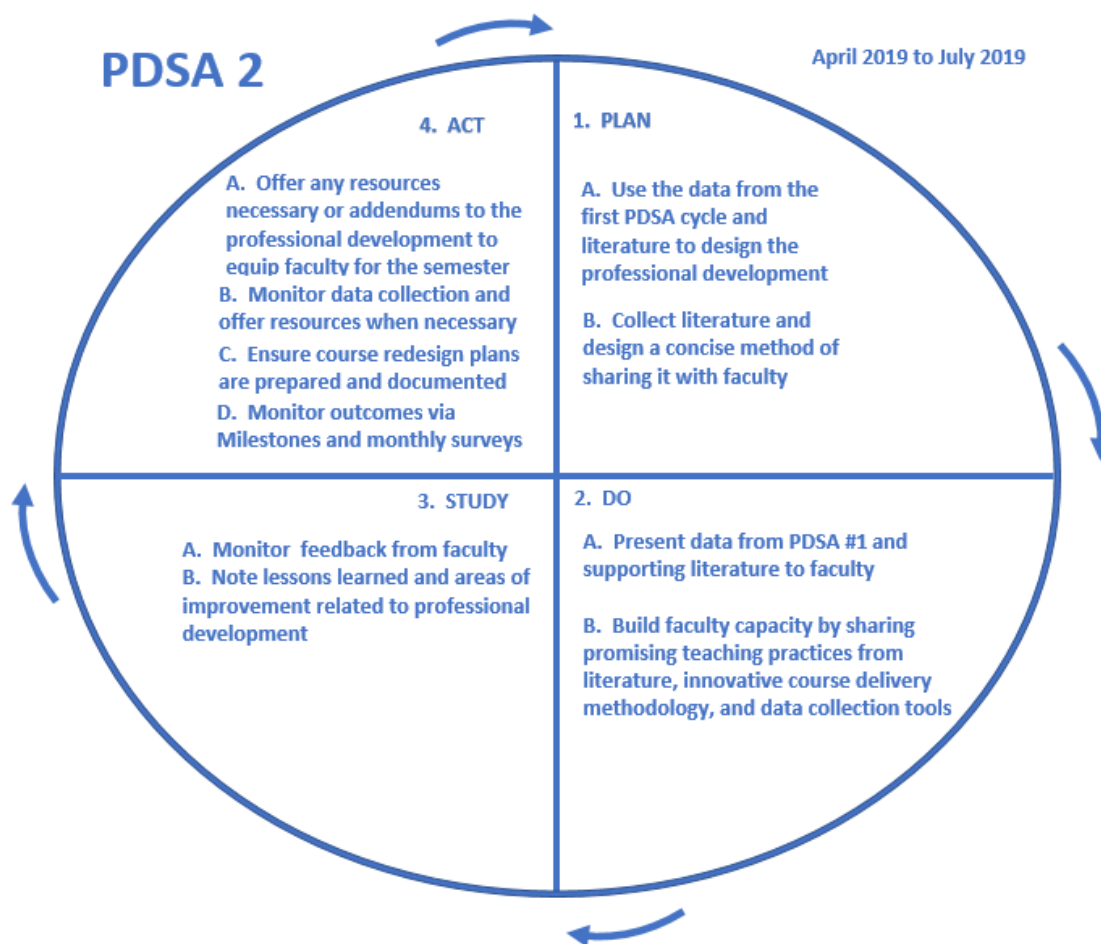
Plan

During the planning phase of PDSA 2, we organized data from the first PDSA cycle and

assembled professional development resources outlining promising practices for instructors of

foundational courses. Our aim was to design a concise professional development session that would meet the needs of our diverse faculty. Figure 9, a three-column artifact outlining causal factors at both institutions, aggregates causal factors discussed during the initial meetings with faculty and became our foundation for the professional development session. The outer columns outline causal factors by the individual institutions, and the central column lists shared causal factors voiced by faculty. In the subsequent sub-sections we reference additional literature supporting the use of promising pedagogies and practices that were identified during this PDSA cycle. These sub-sections clarify the literature used to design faculty development resources and the resulting course-level changes.

Classroom Atmosphere.

The classroom is the primary space in which faculty and students interact, and is, therefore, an important consideration when designing intentional engagement opportunities. Building community, collaborative teams (Sharan, 1980; Barr & Tagg, 1995) and a supportive environment can have a profound positive impact on learning (Barkley, 2010). This focus can lead to relationships of positive interdependence, where both faculty and students are able to depend on one another and thrive.

> To transform practice that can sustain progressive educational change, researchers, reformers, and practitioners must jointly fashion a vision of constructivism that involves more than theories of learning or instruction. The vision should include a picture of schooling with all the players, the conflicts, and the tensions" (Windschitl, 2002, p.165).

Faculty must regularly utilize new information from students and build upon what is known and dynamically adapt to impact student learning (Barkley, 2010). In the absence of clearly defined

goals (a to-do list), it is easy for people to wander, or miss details related to the achievement of outcomes. Students bring varying levels of experience in the classroom. Therefore, at the beginning of each course, there is value in defining the roles and desired actions of both the teacher and student. To accomplish this type of normative behavior modeling faculty should review a checklist regarding actions and timelines that are appropriate in the class. To add further value to the student's academic outcomes, faculty should communicate how these checklist items lead to success within that course. Students benefit from accessible, progressive, and procedural assignments that are logically scaffolded (Kellen 2015).

Collaborative Learning.

Collaborative Learning (CL) involves: (1) intentional design of interactions between stakeholders (2) It also involves the notion of "co-laboring," or the group working together to accomplish stated goals, (3) A central theme of CL is that meaningful learning is taking place. CL becomes transformational when students realize they "must do the work of learning by actively making connections and organizing learning into meaningful concepts" (Barkley, Cross, & Major, 2014, p. 11).   "Similar to the idea that two or three heads are better than one, educational researchers have found that through peer instruction, students teach each other by addressing misunderstandings and clarifying misconceptions" (Cornell Center for Teaching Innovation (CCTI), Collaborative Learning, 2019). For this project, we opted to utilize CL in professional development and encouraged faculty to bring these concepts into the classroom as teaching tools.

Class Norms and Contracts.

Cornell's Center for Teaching and innovation recommends the consideration of class

norms and contracts as tools for developing an inclusive and supportive classroom atmosphere (CCTI, Building Inclusive Classrooms, 2019). Inclusion was an important discussion point for the faculty participating in this project. In addition to reviewing recommendations from literature (Brookfield & Preskill, 2005; Davis, 2009), the faculty offered their own experiences and suggestions for developing a supportive and collaborative classroom dynamic. Faculty were keen to point out that when students feel they are part of a community, they are more apt to attend class and contribute actively and openly.

Design Opportunities for Frequent Feedback.

In metacognitive studies, researchers have learned that students benefit from timely and intentional feedback designed to stimulate reflection not only on content but also upon the learning process (Callen, Franco-Watkins & Roberts, 2016). In addition to offering targeted feedback, McGuire (2015) encourages faculty to remind students that a) the instructor believes in the student's ability, and b) that the instructor is confident that students can achieve high-quality work. For example, McGuire mentions, that in one study, the simple act of writing a note to students and citing expectations and belief in student ability increased participation in an essay revision opportunity by over 100%.

Supplemental Instruction.

Supplemental Instruction (SI) was pioneered at the University of Kansas City, Missouri, and has been shown to positively influence student learning and graduation rates (Bowles, McCoy, & Bates, 2008). Typically offered outside of the regular class meeting time, Supplemental Instructors are upper-level students who have completed the coursework and then invited by faculty to return to a course as part-time instructors for additional, targeted learning

opportunities. The sessions typically focus on understanding challenges students are having in a given subject and then offering study strategies, practical problem solving, and topical discussions relevant to the coursework. SI studies show increases in engagement and attainment of learning objectives (Kuh, 2003).

Formative Assessment.

Formative assessment is typically a low-stakes, often ungraded assignment designed to measure student understanding or application associated with a learning outcome. Heritage (2010) describes formative assessment as being "...intended to close the gap between where the learner currently is and where the learner and the teacher want to be at the end of a lesson" (p.10). By assessing students regularly, and with low-stakes assignments, instructors can quickly gauge where students are in the learning process of a given lesson or course. This critical knowledge can guide the instructor to areas of improvement, and allow them to focus on topics and experiences designed to enhance student achievement of learning outcomes.

Meeting Basic Needs.

Barkley (2010) discusses the importance of attending to basic needs to allow students to focus on learning. If students are concerned about social-emotional challenges outside of the classroom, it can be difficult for them to put their attention on the daily lessons. While faculty are not always in a position to deal with the myriad of student needs that exist external to the classroom, there is value in faculty building connections with students early, and becoming aware of unmet needs. In doing so, faculty can encourage students to take advantage of services on campus and within the community, as well as build rapport and trust in the classroom (Goldrick-Rab, 2018).

Transparency in Teaching.

Transparent teaching, also referred to as transparent learning, is a term for several practices designed to highlight the purpose, tasks, and criteria related to assignments to make the learning process more explicit and understandable to students (Office of Assessment of Teaching and Learning WSU, 2018). Winkelmes (2013), states that transparent teaching requires a rationale for, and conversations about, assignments, learning opportunities, minor instructional adjustments, and research-informed pedagogy and practice.

Create Accessible Syllabi.

Students enter courses with many different questions, concerns, and a lifetime full of experiences that may serve as barriers or levers to their academic success. The first interaction they have with the instructor or course materials can set the stage for success or failure. A well-constructed syllabus is a tool that supports a strong start for both the instructor and students. It gives students the first impression of what to expect from the course. It also allows instructors to set the class climate and define learning objectives (Universal Design for Learning in Higher Education, 2019). The use of pictures, a table of contents, and quotes from former students may prove to bolster incoming students. Instructors should consider the use of positive, rather than punishing, language. McGuire reinforces that faculty should "create a syllabus that makes course structure and expectations crystal clear. Include in your course structure many opportunities for students to demonstrate competency" (2015, p.82).

Set Clear Learning Outcomes/Targets and Understanding.

Consider the impact of designing a system of learning within the classroom in which every step a student takes leads to the defined and desired destination. Stephen Covey called it

"beginning with the end in mind" (1989, p.97). Wiggins and McTighe (1998) wrote that

teachers are in fact, designers. An effective instructional designer is mindful of the audience and

how intentional design has the potential to positively impact the utility and function of

educational interactions. Instructors can improve academic outcomes for students if they first

consider the tasks that students must complete. They must facilitate learning opportunities and

design scaffolded periods when students might complete the necessary tasks. A well-designed

syllabus is the result of this kind of end-design thinking.

Foundational Knowledge.

Students enter classes with varying levels of foundational knowledge regarding how to be

successful (McGuire, 2015). Barkley (2010, p.11) wrote, "Students' expectations are

inextricably linked with their self-perception." The belief or confidence level students have

influences their expectations entering the classroom setting. Improvement of academic outcomes

may occur when teachers acknowledge the varying levels of readiness that exist among their

students and adjust course delivery to help all students meet learning objectives.

Targeted and Scaffolded Learning.

When students have a target (or example) for application and integration of foundational

knowledge, they are more likely to achieve learning outcomes. Making learning targets visible,

understandable, and iterative can have a significant positive impact on student learning (Moss &

Brookhart, 2012). By offering a student an example of exemplary work, and then breaking it

down into parts (learning targets and scaffolding), students often have higher success moving

beyond abstractions and toward constructing assignments that involve higher-order learning,

complexity, application, or synthesis. As Barkley (2010, p.87) describes it, we must move from

"covering course content" toward "uncovering course content," essentially making the hidden structures and scaffolds within lessons visible and accessible to students.

Relevance & Assignment Choices.

Authenticity in the classroom can build trust, and promote a classroom atmosphere that is motivational for students (Barkley, 2012; Provitera & McGlynn, 2001). Self-determination and autonomy can be encouraged if students see a connection between coursework and their personal goals. To promote self-determination, Kursurkar, Croiset, & Ten Cate (2011) encourage faculty to focus on student needs, offer students multiple assignment options in the classroom, and help students connect lessons to the broader goals and implications of the work.

Inclusive pedagogies.

Inclusive pedagogies cultivate awareness and acceptance of differences amongst students. Similar to asset-based thinking, it involves being responsive to dynamics that difference amongst students may create in the classroom, and rough this awareness, encourage a more productive learning environment (The Derek Bok Center for Teaching and Learning, 2019). Students actively interpret the actions of teachers, and thoughtfully designing an inclusive learning environment defines classroom culture. Without planning and thoughtful design, a course may unintentionally favor one group of students over others. Instructors can mitigate this by acknowledging that both they and students enter classrooms with different preconceived expectations. With this in mind, they can more readily make the proper adjustments to behaviors, assignments, and communications. These "inclusive moves" (The Derek Bok Center for Teaching and Learning, 2019) should be concrete steps aimed at creating learning environments that encourage engagement, authenticity, and respect for all students.

Metacognition.

Dr. Saundra McGuire's book, *Teach Students How to Learn*, describes metacognition as "thinking about thinking" (2015, p.5). John Flavell, an educational psychologist (Flavell, 1979), first coined the term metacognition in the 1970s. Metacognition investigates strategies that make the processes of learning visible to students to help them develop strategies for improving their study plans and habits.

For this improvement project, we found significant utility in Tanner's 2012 article, *Promoting Student Metacognition*. Though the original audience for her writing was Biology instructors, Tanner's report offers a series of easy to use tables that allow instructors to understand and adapt metacognitive approaches to the classroom activities.

Use of Self-Evaluation Rubrics Completed Prior to Assignment Due Date.

Designing rubrics that offer clear guidelines and criteria for grading make expectations clear to students (McGuire, 2015, p.95). Students can better assess their learning and development if faculty share rubrics before an assignment due date. Barkley (2010) posits that it is impactful for students to know how to evaluate their learning and the learning process. In allowing students to use a rubric to self-evaluate, they take ownership and responsibility for determining how well they are progressing.

Providing Sample/Example Papers & Breaking Down Steps for Assignments.

McGuire (2015, p.86), offers "six strategies for enhancing competence." Included in this list is the notion that providing exemplars to students can help them see what success looks like; a process that shares ideas with Barkley's (2010) scaffolded learning techniques. Helping

students understand how components assemble into larger assignments can have a significant

impact on learning.

Intentional Conversations.

Dr. McGuire encourages faculty to ask students "what they do well" and "how [they

became] good at that activity" (2015, p.90). Reminding students that developing proficiency

incorporates a combination of process refinement and critical awareness can help them

understand how to adapt previously successful learning techniques to the tasks at hand.   Weekly

goal setting (McGuire, 2015) and time management embedded in assignments can help students

forecast and plan optimal study strategies.

Reflection.

Making time for critical reflection is a primary component of intentional learning

(Roberts, 2016). By allowing students and faculty to reflect on the process, we can better

understand that which is most (and least) effective. Two extremely potent reflection tools

include "The Muddiest Point" (Tanner, 2012, p.116), and Exam Wrappers (Schuler & Chung,

2019). The Muddiest Point is a teaching strategy that invites faculty to gather feedback directly

following a lesson. Students are encouraged to submit comments on the section of the lesson that

is least clear to them, or that requires further investigation. In doing so, faculty can target

additional learning opportunities. Exam wrappers are targeted assignments that invite students to

critically exam their study strategies, following a test, and design a plan for future success and

improvement.

Do: In-Person Professional Development Sessions

The meeting on May 7, 2019, was the first joint gathering of the faculty cohorts from BC and ICC. After introductions, we reviewed the progress of the improvement project thus far, outlined goals for the day, and reminded faculty about the milestone framework we planned to use for data collection. We then jumped into primary drivers of change. We built capacity amongst faculty by sharing data, innovative course delivery methodology, and data collection tools in foundational courses.

Study: Revising Resources

Following the professional development session, we revised resources and data collection methods based on faculty input. Specifically, we worked with the Western Carolina IRB to revise our milestone data collection tool to include a menu of course redesign options. We also added a section on the form to record the progress of students in the Adult Basic Education program.

The pre-intervention surveys offered to faculty and students gathered baseline data on a series of factors, but primarily focused on the following perceptions: engagement, the importance of coursework, and the importance of practices and pedagogies in the classroom. We administered the first surveys to both students and faculty before interventions; the faculty took the survey after our first meeting in April 2019, and students completed the survey in August 2019.

Engagement.

Over 68% of the 290 students who took the first survey rated their engagement as "very high," or "high." None of the 11 faculty who took the survey rated student engagement as "very high," but 40% did rate student engagement as "high" in their classes (see Figure 13). The

majority of faculty (60%) rated their student engagement as moderate.   Figure 14 compares

faculty and student perceptions of faculty engagement. Almost all students and faculty agreed

that faculty engagement was between "very high" and "high."
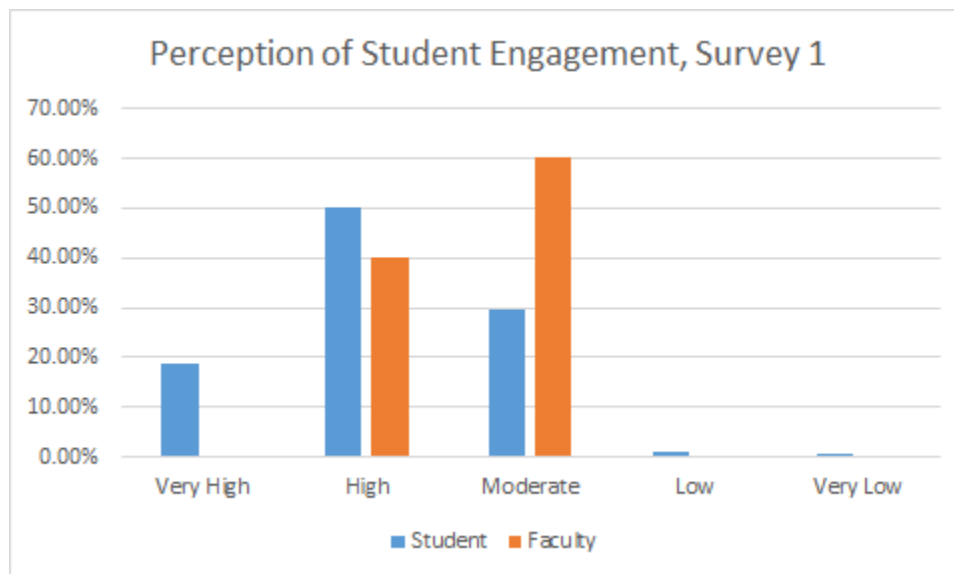
Figure 13. Survey 1: Perceptions of Student Engagement
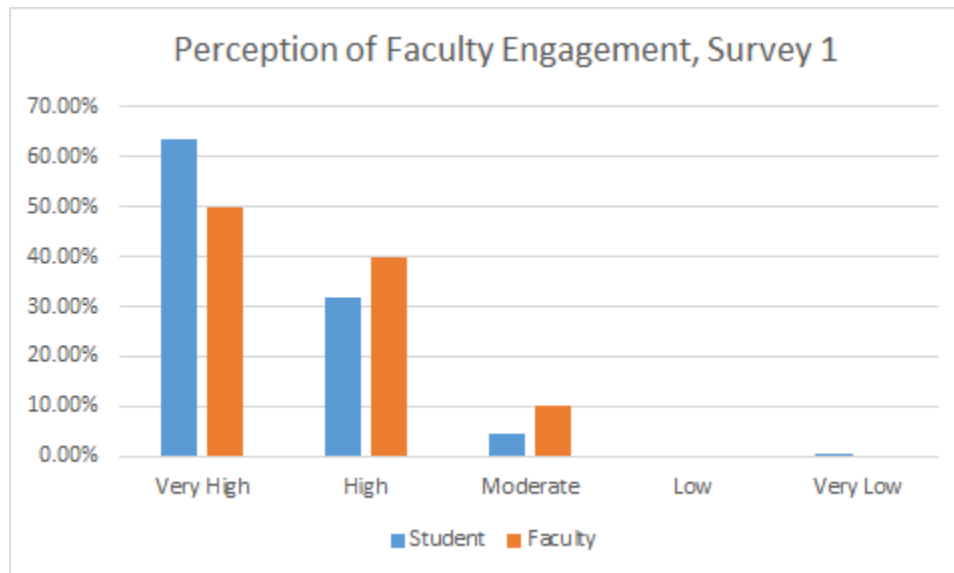
Figure 14. Survey 1: Perceptions of Faculty Engagement.

Teaching Practices.

There was an agreement from the faculty and students on the top three teaching practices: frequent feedback, setting clear expectations and context, and timely (quick) feedback. Engagement in the classroom that prompts reflection was in the top-five list of essential practices for both groups. The lowest rated practices also saw agreement on collaborative/group assignments; however, the ranks (on a five-point Likert scale) were 4.0 for faculty, and 3.8 for students (see Figure 15).
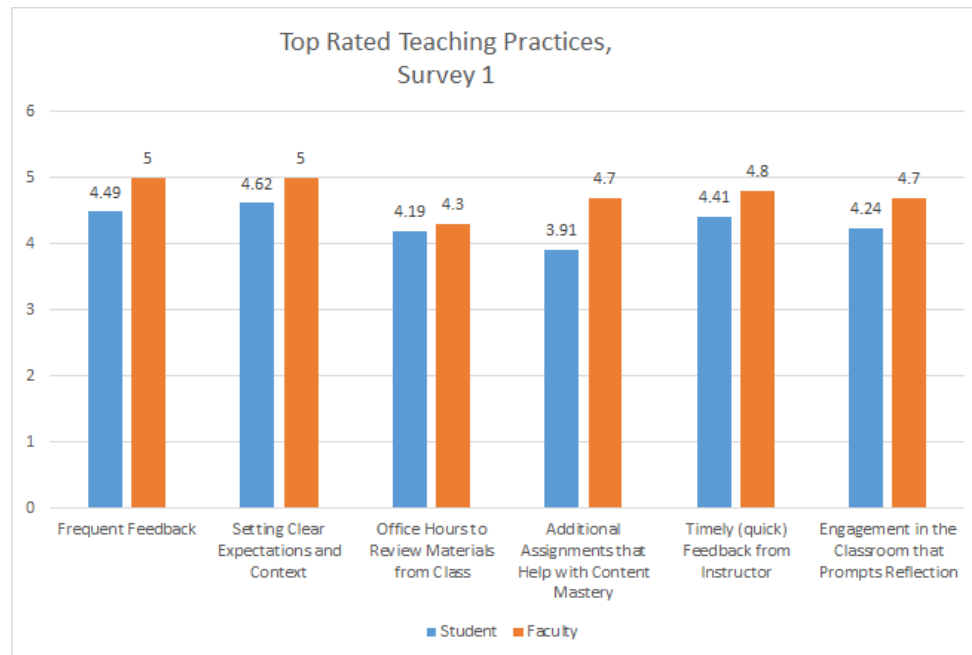
Figure 15.   Survey 1: Top-Five Rated Teaching Practices

Act: Preparing for Classes

In preparation for the fall semester, we provided faculty with additional research articles, theoretical frameworks, and pedagogical resources informed by the Do and Study phases of this PDSA. Just before classes began, we checked with faculty to ensure that course redesign documentation and online data collection tools were in place to monitor grades, surveys, perceptions, and measurable skills gains during PDSA 3.

PDSA #3: Implementing Course-level Change, and Results

PDSA 3   August 2019 to December 2019

4. ACT

A. Monitor final grades and persistence in January 2020 for significant change

B. Finalize data collection for disquisition presentation at WCU

C. Adopt or adapt? Decide how the colleges will use these data to inform future improvement efforts

1. PLAN

A. Prepare data collection folders online and ensure data security

B. Ensure that communication systems are in place for all faculty

3. STUDY

A. Analyze survey data against predictions. Did the percpetions of students or faculty shift? Was there a relation to academic outcomes?

B. Did grades significantly change?

2. DO

A. Monitor milestones for unintended consequences

B. Evaluate 30-day surveys from faculty and students as a balancing measure

C. Collect mid-term and end of course grades and final surveys

Figure 16. PDSA 3.

Plan: Preparing the Pilot Program

In the fall of 2019, we utilized a third PDSA cycle as a process measure to focus on learning in a small context. This process enabled faculty to refine course delivery (pilot program), in the hopes that the knowledge gained would benefit student learning and be scalable to larger parts of our organizational system (Bryk et al., 2015). We monitored and maintained

regular communication with faculty and utilized Qualtrics and Google to share information among our Networked Information Community (NIC).

Do: Utilizing Promising Practice and Pedagogies

Faculty and staff monitored how assignments and course redesign influenced academic outcomes for students. Throughout the semester, we sent faculty digital reminders and engaged in communications regarding expectations and data collection. We also scheduled regular meetings with them, in person, to review progress. At these meetings, we discussed any challenges or innovations learned along the way to continue improving course delivery (Bryk et al., 2015). Mid-semester survey results acted as a balancing measure to monitor participant practices and perceptions regarding course delivery. Student grades linked to redesigned pedagogies, assessments at midterm, and the end of course grades were recorded in order to understand how the initiative affected the course delivery, student learning, and grades.

Study: Results

Midterm Data.

As outlined in our formative assessment table (Table 1), we have three primary measures that were reviewed at midterm:

- Did the faculty complete the milestones (process measure)?

- Are grades different from historical grades (driver measure)?

- Did perceptions of students and faculty change (balancing measure)

Process measure: Milestone completion.

Figure 17 represents the number of logged milestones as of October 19, 2019, approximately mid-semester. The results show a downward trend in the submission of milestones, but this was somewhat expected, since faculty pacing of assignments varied across courses involved in the improvement project, and since faculty were offered autonomy to pace milestones as appropriate to their courses. The high number of milestones logged (14) for milestone 1 are because some faculty were teaching multiple course sections and accidentally submitted duplicate milestones. We informed the faculty that if they were doing the same milestone in numerous sections, they no longer needed to provide duplicate copies of the same information. At midterm, we expected to see 2-3 milestone submissions from each participating faculty, since they had submitted dated milestone planning sheets that indicated they would be further along. For a few, that was not the case. When we noticed the drop off in submissions of milestone tracking data we reached out to faculty via email, they responded that they were still teaching milestone assignments at the times they had proposed in their classes, but that they had fallen behind on the data reporting.
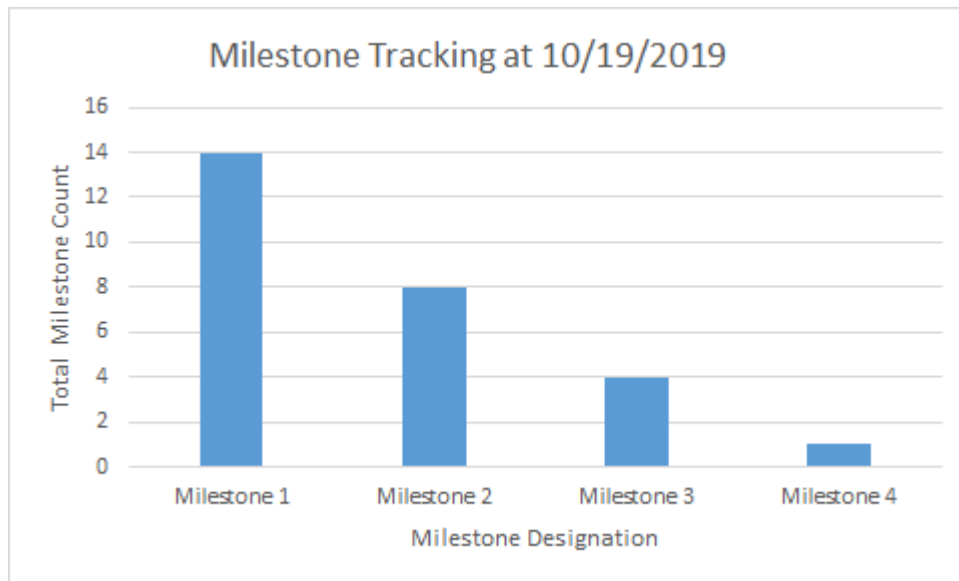
Figure 17. Milestone Tracking Completion at Midterm

Driver Measure, Grade Data Comparison.

Did interventions drive significant changes in grades at midterm? As a driver measure, we pulled mid-semester grades for each course at Brevard College to compare them against five years of historical end-of-course grades. For participating courses with grades, we used chi-square analysis to analyze if a significant change exists between the historical averages and those reported during this study. Isothermal did not pull midterm grades because, ABE courses in this study are only 5 weeks in length, so no equivalent historical data exists.

At midterm, DFWI rates in EXS 110, Math 100, Math 141, and English 111 showed no statistically significant change when compared to five years of historical rates; we must therefore fail to reject the null hypothesis (see Table 3). In Psychology 101, Biology 105, and Biology 120, there appears to be a significant change (improvement) in DFWI rates when compared to the five-year historical rates, we can, therefore, reject the null hypothesis (see Table 4).

Table 3.

Chi-Square Analysis of Midterm DFWI Rates, Fail to Reject the Null Hypothesis

Classes	Significance of Change Between Historic Grades and Midterm Grades During Study
Exercise Science 110	$\chi^2(1)=.012$, $p=.913$
Math 100	$\chi^2(1)=.302$, $p=.582$

| Math 141 | $\chi^2(1)=.783, p=.376$ |
| English 111 | $\chi^2(1)=.771, p=.380$ |

Table 4

Chi-Square Analysis of Midterm DFWI Rates, Reject the Null Hypothesis

Biology 105	$\chi^2(1)=5.520, p=.019$
Biology 120	$\chi^2(1)=23.750, p=.000$
Psychology 101	$\chi^2(1)=4.394, p=.036$

Balancing Measure: Midterm Survey Data.

We surveyed faculty and students a second time, at mid-semester, as a balancing measure, and compared their responses to the first survey to guard against unintended consequences resulting from our changes in the classroom. Student surveys had a decline in participation; with a student response rate of 306 on survey 1, versus a response rate of 203 on survey 2. Faculty surveys saw a decrease as well; 11 faculty completed survey one, while only 9 completed survey 2, as of October 19, 2019. The independent samples t-test, in all cases, yielded p-values that indicate no significant change in perceptions between the start of the semester and midterm (see Table 5).

Table 5

Independent Samples T-Test of Balancing Measures, Surveys

Survey Question	Faculty Survey Midterm	Student Survey Midterm
Student Engagement	*t(17)=.137, p=.893*	*t(505)=.379, p=.705*
Faculty Engagement	*t(18)=.258, p=.800*	*t(503)=1.315, p=.189*
Anxiety	*t(17)=-.320, p=.753*	*t(503)=-1.017, p=.310*
Faculty Perception of Their Skill & Knowledge Gains	*t(18)=-.043, p=.966*	
Faculty Confidence in Applying Research-Informed Pedagogy and Practice	*t(18)=.326, p=.748*	

We recognize that an independent samples t-test is less robust than a paired samples t-test. However, these were blind surveys, and the anonymity of participants makes the independent samples t-test a viable analysis tool since we are unable to match samples. An independent samples t-test allows us to compare the new value against the mean of the historical values. A *p-value* that is less than .05 enables researchers to reject the null hypothesis. All of the *p* values measured in Table 6 are greater than .05, which means that we cannot reject the null hypothesis. Balancing measures seek to ensure that unintended consequences are not manifesting after a change to a system. The data collected in the surveys indicate that there was no significant change in perceptions, anxiety, or engagement at midterm during this study.

Results*: *End of Semester Data.

At the end of the study, we analyzed surveys and end-of-course grade data. This information was compared against our predictions that gateway course redesign, informed by literature and experience, would reduce DFWI rates in gateway courses, and increase the on-time achievement of level gains in Adult Basic Education. We also looked to see if there was a shift in faculty and student perceptions related to the classes and practices used to support learning.

For this improvement project, student success was measured using DFWI rates in participating courses that offered grades, while measurable skills gains were used in ABE courses. As in the midterm analysis, we used a chi-square test to check for statistically significant changes in course outcomes (see Table 6).

Table 6

Chi-Square Analysis of Final DFWI Rates and Measurable Skills Gains, Fail to Reject the Null Hypothesis

Classes	Significance of Change Between Historic Grades and Final Grades/Level Gains During Improvement Project
Exercise Science 110	$\chi^2 (1)=.875, p=.350$
Math 100	$\chi^2 (1)=1.025, p=.311$
Math 141	$\chi^2 (1)=.870, p=.351$
English 111	$\chi^2 (1)=.252, p=.616$
Math 2 (ICC)	$\chi^2 (1)=.010, p=.919$

ABE	χ^2 (1)=1.517, p=.218

Table 7	
Chi-Square Analysis of Final DFWI Rates and Measurable Skills Gains, Reject the Null Hypothesis	
Biology 105	χ^2 (1)=10.763, p=.001
Biology 120	χ^2 (1)=8.095, p=.004
Psychology 101	χ^2 (1)=6.730, p=.009

At the end of the fall semester, we used a chi-square test to check for statistically significant changes in DFWI rates and measurable skills gains in the participating courses. We failed to reject the null hypothesis for Exercise Science, Math 100, Math 141, English 111, Math 2, and ABE courses. These outcomes were the same as our mid-semester assessment, with the addition of being able to include Math 2 and ABE, from Isothermal Community College. We were able to reject the null hypothesis in the same three courses as midterm; Biology 105, Biology 120, and Psychology 101.

Faculty feedback: Qualitative.

We were curious to see if faculty perceptions had changed much, because of the improvement project, and if faculty planned to continue utilizing the new skills and knowledge they had developed after the conclusion of the initiative. Faculty perception of student engagement declined slightly during the semester, from 2.54 to 2.37 (between "high" and "moderate"). Their perception of their engagement in the coursework was virtually unchanged,

with faculty ratings of 1.64 in the first survey and 1.63 (very high=1, and high=2) in the final

survey. Half of the faculty involved in this initiative reported that they had definitely developed

new skills and knowledge that contributed to the achievement of student learning outcomes; the

other half stated that they probably had developed new skills and knowledge. Interestingly, the

top-six faculty perceptions related to which teaching practices most influence student learning

remained constant. Similarly, student perceptions remained mostly unchanged. When asked if

they planned to continue using what they had learned during the improvement project, five

faculty stated that they definitely would, while three said that they probably would. Our

observations, based on conversations with faculty throughout the semester, is that their level of

excitement and energy regarding this improvement initiative lessened as the semester wore on.

The decline of milestone logs and completion of surveys, as well as informal correspondence and

conversations, are further evidence of the initiative fatigue participants experienced. People got

tired. That said, the survey data indicate that faculty see value in the initiative, and most plan to

continue using what they have learned in future iterations of the courses.

We have posited that our educational system contributes to the challenges students face.

One participating faculty member felt compelled to write an email regarding her experience. She

realized that she was expecting and setting unrealistic goals for her students. Further, she came

to understand that students need explicit instruction regarding how to make connections between

the lecture and application of the intended learning. She had previously made assumptions

regarding the ability of students to read for understanding and constructively take notes in a way

that helped them increase their knowledge. She learned that she had to challenge her

assumptions; about education and what works best for students. She "made several pedagogical

changes throughout the semester including the use of collaborative learning groups, study strategies, metacognitive prompting and the never-ending lectures on grit and resilience."

Student Feedback: Qualitative.

Student survey data related to which teaching practices most influence their learning was mostly unchanged as well. The only notable difference at the end of the semester was that students ranking of "Engagement in the Classroom that Prompts Reflection" moved from the seventh on the list to the fourth highest position. Students rating their engagement as very high or high remained virtually unchanged between the first and last survey; survey 1=68.84%, and survey 3=70.74%. Student perceptions of faculty engagement, specifically those rated as "very high," increased over the semester with Survey 1=63%, and Survey 3=72%.

We felt compelled to share some selected student feedback from the final surveys. Not many students offered input in the open response section of the survey. However, many of those who did, commented on how vital their instructors were to their success. One student said that "Even when I have felt hopeless and incredibly overwhelmed, she (the instructor) has been understanding and more than willing to work with me to get me back on track (even when I told her I was okay, she knew I wasn't!). She is the absolute best, and she has been a saving grace to the first semester of my freshman year." Another student stated, "I thought (my professor) did a fantastic job of conveying the subject matter in a manner that made it easy for students of all backgrounds [to] understand. She was very helpful in all aspects inside and outside of the classroom."

An unexpected piece of qualitative feedback came in the form of an unsolicited email from a participating faculty member. She reported that:

One moment, in particular, came as a surprise to me. I was returning assignments that had

been graded and one student had made a slight improvement. Without giving the

transaction much thought, I handed the paper to the student and walked away. After a

split second evaluation moment, I turned around and approached the student again but

this time, I leaned over and made eye contact with her and I quietly delivered the

message of "your grade improved, keep going, you've got this." The student smiled a

wide smile and simply said, "You think so?" I reassured her with a positive response and

later, she shared with me that she had planned on dropping the class at the end of our lab

class and that due to our "chat," she decided to give it one more try!

This feedback is not only edifying to hear, but speaks to the level of engagement and hope that

this faculty member was able to share with her students. This story reminds us that every action

in the classroom has the potential to support student persistence.

Act: Reflection and Impact

Our theory of improvement at the beginning of this process was that *effective*

professional development on research-informed pedagogical practices will result in increased

efficacy and capacity for faculty teaching gateway and ABE courses leading to improved student

academic performance. We saw statistically significant changes in DFWI rates in 3 of the 9

courses that were included in this improvement project. It is worth noting that two of the three

courses that experienced this significant improvement involved faculty who were both new to the

G2C process, and these faculty were in their second year of full-time, college-level teaching.

Faculty involved in G2C for two or more years had already experienced different (but similar)

capacity-building opportunities and had multiple semesters of improvement in academic

outcomes. We believe that this prior G2C participation and the corresponding decrease in DFWI rates, may, in part, explain the non-statistically significant changes witnessed in some courses within this initiative. With the ABE and Adult High School faculty, we recognize that this was the first attempt at course refinement and that as their capacity continues to develop, academic outcomes may improve.

At this time, based on our experiences collaborating with faculty and students, we have no plans to abandon these processes. We believe that our theory is sound, yet we recognize that there is room for improvement in our implementation. We saw initiative fatigue, a lack of time and space, and a general sense of exhaustion from faculty as the semester wore on. These problems persisted despite the fact that the faculty offered input in the design and implementation of this improvement initiative. In future iterations of this process, we will seek to mitigate these issues. We will be engaging faculty in conversations in the spring semester to discuss how we might refine the reporting process, and invite stakeholders to help us innovate around how to overcome the mid-semester exhaustion.

In addition to improving grades, we hoped that participating faculty would apply new skills and knowledge in the classroom and develop a sense of ownership for the work. We put a premium on valuing reflective self-inquiry, related to how courses and pedagogy might be refined to better support student learning. Koch sees value in "openly naming [faculty] as primary agent[s]...in the contemporary post-secondary [educational] reform movement" (Koch, 2018, p.4). Like Tinto (2006), Koch is saying that faculty are the key to helping students achieve their educational goals, and thereby mitigating the high rates of failure in higher education. As evidenced in both our survey data and email correspondence, many of the faculty involved in this

improvement project acknowledged how changes in the way they interact with students can make a difference. They recognized their potential to leverage small changes in practice to yield big changes for students.

Limitations of the Study

Both institutions involved in this study are relatively small. The sample sizes were further limited by the number of participating professors and by limited course enrollment. The design of our NIC intended to decrease complexity, and increase the ease of study participation. Despite our best efforts, faculty still felt pressure from competing obligations as the semester wore on.

The course level changes in pedagogy and practice for this improvement project were limited to three primary categories developed by faculty: classroom atmosphere, transparent teaching, and metacognition. However, within those categories, faculty had a significant amount of latitude to choose which changes to implement in their particular classes. This variation creates statistical noise related to isolating the utility of specific pedagogies and practice within a given course, or across the entire sample. Additionally, there are countless other factors, in and out of the classroom, that can influence student success. For this initiative, we were limited to self-reported, course-level changes, and the resulting grade, or test data. To isolate how specific course-level changes affect student success, additional research is required.

Utilizing DFWI rates as a measure of student success is not without problems. As with most practitioner research, the variables influencing outcomes are multivariate. We recognize that variables like longitudinal changes in the student body, which professors are teaching a course, the time of courses, and other such factors make it difficult to isolate how historical

examples of these courses differ from our sample. As mentioned earlier, grading is also highly

subjective and may vary between professors and sections of a course. There is also the risk of

grade inflation.

One participating instructor wrote to us and explained that the final grades in their class

did not fully represent student achievement. There was a small group in this person's class who

had not earned grades high enough to move on to the next course in the sequence, yet the

instructor felt that the students were ready to advance and therefore adjusted the grades. This

instance highlights the fact that grades are often an imperfect measure of student learning. We

still believe that, in the instance of this study, grades serve as a useful summative measure linked

to student success and long-term persistence. Despite grades being imperfect measures of

learning, there is a body of evidence showing a correlation between DFWI rates and persistence

(Downing, 2016, Koch, 2017). It is worth noting that the class where grades were adjusted was

not one of the courses with statically significant grade improvement.

The institutions in this study, like most colleges, find themselves limited by time, money, and

other scarce resources. Faculty commitment to this project was clear, as evidenced by survey

data, discussions, and correspondence. Not one of them was opposed to the goals of this project.

However, as the semester wore on, it was increasingly difficult for them to remain focused on

improvements while also performing other tasks related to their jobs.

Lessons Learned

We offer this section to leaders as a cautionary tale, enumerating 3 primary lessons we

have learned during the process. Our hope is that these lessons help guide future improvement

initiatives and allow others to avoid some of the challenges we faced during this study. We

believe that the premise of our theory of improvement is sound and warrants further exploration

and study.

Lesson 1: Follow the Plan

Regularly referring back to guiding improvement questions posed by Langley et al (2009)

offered value and confirmation that the processes we developed could inform systemic changes

on our campuses. Triangulating improvement using grades, engagement, and value questions

helped us get a more complete picture related to perceptions and outcomes in foundational

courses and inform future improvements.

Lesson 2: Consider the Numbers and the Story

In order to get a more complete picture of the effects of a change to a system, there is

value in having multiple data-streams. Specifically, one should consider qualitative, numeric

data, and open-ended narratives from participants impacted by the system changes.

People require time and space for reflection and integration of new knowledge into their

daily lives. The fact that we saw very little statistical change related to faculty and student

perceptions between the pre-intervention and post-intervention surveys reifies that their values

related to what matters in the classroom are well established.

Other belief systems appeared to be more changeable. We saw shifts in faculty language

usage related to deficit ideology during this study. In conversations and written correspondence,

we saw a move towards recognition of how systems were impacting student success, rather than

a focus on why "students do not…" do things in classes. Some faculty voiced this realization in

meetings and via email interactions. We made a point to encourage discussions related to deficit

ideology. Had we not engaged in such meetings, or had open channels of communication, this part of the story may have been missed.

Some of the most powerful evidence gathered during this project came in the form of feedback from surveys and unsolicited emails submitted by participants. The stories therein provide a vibrant and compelling glimpse of how students and faculty felt about this improvement effort. In the future, we will provide more guidance and space for such reflection embedded within the data collection tools. In many ways, the human stories are as, or more, compelling than the numbers.

Lesson 3: Balance Workload

Upon further consideration, we can imagine a project that would better balance the workload and development of faculty capacity related to new pedagogies and practice. In such a project, we might identify areas of change (as was done here), but then also consider how faculty might de-escalate that which is not essential to student achievement of learning outcomes. In doing so, we would hope to make room for the additional workload that such a project requires. Focusing on small changes, and doing this type of work over an extended period of time would likely make capacity building amongst faculty more focused, and sustainable. We hope that by reprioritizing some aspects of the coursework, committee work, or other job-related duties, we could create more space for faculty to innovate. We realize that to create time and space for sustained improvement efforts, an increased financial commitment on the part of our institutions is most likely required.

While faculty completion of milestone assignments declined at the midterm, it is worth noting that by the end of the semester, faculty had almost all caught up on their reporting. As

stated by some faculty at midterms, they were completing milestones, but the submission

timeframes did not always align with the pace of their classes and other commitments.

In both institutional contexts, participants stated that they would certainly consider

continuing the work. In some cases, the faculty commitment to utilizing and continuing the use

of tools developed during this study was extremely high. While the work needs further

refinement to be sustainable, and to better understand how particular practice and pedagogy

impacts learning, both institutions plan to continue developing these programs.

Lesson 4: Sustaining the Work

This work has been meaningful to both faculty and students at our institutions. Therefore,

we must consider how best to sustain this work. It will clearly take more time for our long-term

goals related to persistence, graduation, and the improvement of lives for all students to become

realized at scale. For this to happen, we must develop champions and leaders amongst participants

involved in this study. Doing so will require the development of distributive leadership

opportunities for faculty; opportunities where they can take even greater ownership of the work,

and share it with their colleagues. The changes to systems in this study were largely faculty-driven.

A key next step in this process will be to invite participating faculty to develop future cohorts

within their disciplines. Ideally, they will serve as facilitators and leaders who will continue to build

faculty capacity and investigate the impact of course-level changes leading to increased student

success.

<div align="center">**Conclusion**</div>

Tinto distinguishes persistence and retention. "Retention refers to the perspective of the

institution," and "persistence refers to the perspective of the student" (2010, p. 53). As

practitioner-researchers, we realize that retention and persistence both serve to benefit all parties

involved in academic endeavors. Students come to college with complex needs in order to be successful in their classes; this project sought to embrace the diverse needs of learners while focusing on what our college systems can do to empower faculty to improve course-level outcomes. If we are to design practices and systems that better support a wide range of learners, we must improve our understanding of student needs and effective pedagogy so that we may offer faculty a suite of teaching tools that address the needs of diverse learners. "It is one thing to understand why students leave; it is another to know what institutions can do to help students stay and succeed" (Tinto, 2006, p.5). Similarly, Bryk et al. said, "to know that something is important is not the same thing as knowing how to make it happen regularly and well" (2015, p. 171). Without a regular assessment of systems and focusing on the needs of students, educational institutions run the risk of missing the opportunity to make meaningful improvements that will benefit student success.

If we are not able to keep our attention squarely aimed at the learner and learning, the efforts of higher education are fruitless. Terry O'Banion likens fiscally motivated educational processes that ignore the needs of learners to "trimming the branches of a dying tree" (O'Banion, 1997, p. 13). "Retention is ultimately an educational matter. Without learning, student retention is... a hollow achievement" (Tinto, 2010, p.78). As educators, we cannot continue to accept high failure rates in foundational courses as an inevitability. Instead, we must turn the mirror back on ourselves and examine how we are designing systems that support student learning (JNGI, 2016; O'Banion, 1997; Tinto, 2006). Relationships are a key part of this type of work. As educators we must get to know our students in order to serve them well. Projections show that by 2020, "67% of the jobs in North Carolina are projected to require postsecondary education. In 2015, only an estimated 48% of North Carolina's prime working-age (18-64) adults had a

postsecondary degree, certification, license or other credential of workplace value" (North

Carolina Community College's Website, 2018). These facts mean that there is a lot on the line

for students in foundational courses across the country.

Koch (2018) calls out higher-education faculty to be agents for change and provides

compelling evidence that classroom practice has the potential to advance social mobility and

social justice. Creating educational environments that are more equitable, where students can

succeed academically, is at the heart of this disquisition. If we utilize improvement science

tools, new knowledge related to problems of practices should develop as a result of each PDSA

cycle. One of the changes that will help catalyze the use of new knowledge is moving away

from an organizational improvement paradigm solely reliant on extrinsic measures. Grades,

budgets, and student numbers are only part of the educational story at our institutions. Our

systems are heavily reliant on such measures. We hope that continuing work on student success

will lead to sustainability at our schools, while simultaneously developing a humanistic model

that creates systems changes that help students persist and complete.

Education leaders spend a lot of time defending institutions, and ourselves, and often pass

the blame of limited student success to others. As leaders, we must be vulnerable. We must be

open and willing to consider a long-term commitment to iterative and progressive knowledge

building within practitioner research to revolutionize systems that have persistently produced

unsatisfactory outcomes. Foundational courses regularly produce such outcomes, and

institutions of higher education should feel an obligation to reevaluate this part of their systems.

We read warnings about the importance of sustaining ongoing professional development (O'

Bannion, 1997; and Hattie, 2012), initiative fatigue (Bryk et al., 2015), differentiation vs.

integration (Bolman & Deal, 2013), challenges related to cultural change (Gioia & Thomas, 1996), and the importance of continuous improvement (Desimone et al., 2002). Yet, we were unable to internalize this wisdom regarding organizational change until we initiated this work. This improvement project has reminded us of the truth in the Wingspread Group's assertion that "putting learning at the heart of the academic enterprise will mean overhauling the conceptual, procedural, curricular, and architecture of postsecondary education on most campuses (1993, p.14)" is required. Despite the foreknowledge of numerous obstacles from literature, and intentional design to consider them, we found ourselves coming up against long-standing problems of practice, which make a cultural and practical change so challenging.

People want to be involved in meaningful work (Kouzes & Posner, 2002). We learned that to improve outcomes in foundational courses, we must enlist others to collaborate, invite them to continue to set goals and reflect on outcomes, innovate to drive change, and prioritize the needs of students in all cases. This improvement effort demonstrates a low-cost/high-yield intervention when compared against the potential cultural, academic, and financial benefits. Students come to college with hopes and dreams for a better future, and they entrust our colleges with some of their most precious and vital ideals. If we fail in this work, we are failing not only the organizational mission, but also we are failing our students by limiting their options, opportunities, and leaving them with no hope for a better future.

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Appendix A

Research-Informed Pedagogical Practices	
Promising Practices	**Source**
Build collaboration into class time	Barr, R. & Tagg, J. (1995). From teaching to learning - A new paradigm for undergraduate education. *Change*, 27(6), 12-25.
Set clear expectations; frequently check for understanding	Barkley, E. F. (2010). *Student engagement techniques: A handbook for college faculty*. San Francisco, CA: Jossey Bass

Making systems navigable: Do not assume students have college knowledge	Conley, D. T. (2008). Rethinking college readiness. *New Directions for Higher Education*, 2008(144), 3-13.
Teach self-regulating behaviors specific to each class	Barkley, E. F. (2010). *Student engagement techniques: A handbook for college faculty*. San Francisco, CA: Jossey Bass
Provide context for learning objectives, outcomes, and targets	Barkley, E. F. (2010). *Student engagement techniques: A handbook for college faculty*. San Francisco, CA: Jossey Bass

	Roberts, J. W. (2016). *Experiential education in the college context: What it is, how it works, and why it matters*. New York, NY: Routledge.
Provide team-based assignments	Barr, R. & Tagg, J. (1995). From teaching to learning - A new paradigm for undergraduate education. *Change*, 27(6), 12-25.
Give frequent feedback	Barkley, E. F. (2010). *Student engagement techniques: A handbook for college*

faculty. San Francisco, CA: Jossey Bass

Poulos, A., & Mahony, M. J. (2008). Effectiveness of feedback: The students' perspective. *Assessment & Evaluation in Higher Education, 33*(2), 143-154.

Tinto, V. (2010). From theory to action: Exploring the institutional conditions for student retention. *Higher education: Handbook of theory and research* (pp. 51-89). Springer, Dordrecht.

	Hossler, D., Ziskin, M., & Orehovec, P. (2007). *Developing the big picture: How postsecondary institutions support student persistence.* Paper presented at the annual College Board Forum, New York, NY
Use proper classroom set-up: The arrangement of the classroom	Basye, D., Grant, P., Hausman, S., & Johnston, T. (2012). *Get active: reimagining learning spaces for student success*. Retrieved from

	https://ebookcentral.proquest.com
Collaborative/cooperative learning opportunities	Sharan, S. (1980). Cooperative learning in small groups: Recent methods and effects on achievement, attitudes, and ethnic relations. *Review of Educational Research*, 50, 241-271. King, L. H. (1993). High and low achievers' perceptions and cooperative learning in two small groups. *The Elementary School*

	Journal, 93(4), 399-416.
	Chepp, V. (2017). Equity-minded high-impact learning: A short-term approach to student-faculty collaborative research. Humboldt Journal of Social Relations, (39), 163-175.
	Johnson, D., Johnson, R., & Holubec, E. (1998). *Cooperation in the classroom.* Edina, MN: Interaction Book Company.
Experiential education cycle	Roberts, J. W. (2016). *Experiential*

	education in the college context: What it is, how it works, and why it matters. New York, NY: Routledge.
Inclusive pedagogies	Danowitz, M.A., & Tuitt, F. (2011) Enacting inclusivity through engaged pedagogy: A higher education perspective, *Equity & Excellence in Education*, 44:1, 40-56. Retrieved from: https://cdn1.sph.harvard.edu/wp-content/uploads/sites/2096/2017/02/Enacting-Inclusivity-Through-Engaged-

	Pedagogy-A-Higher-Education-Perspective.pdf Diversity and Inclusive Teaching (Archived) (n.d.). Vanderbilt University Center for Learning. Retrieved from: https://cft.vanderbilt.edu/guides-sub-pages/diversity/
Supplemental instruction	Rabitoy, E. R., Hoffman, J. L., & Person, D. R. (2015). Supplemental instruction: The effect of demographic and academic preparation variables on community college student

	academic achievement in STEM-related fields. *Journal of Hispanic Higher Education, 14*(3), 240-255.

Appendix B

Milestone Tracking Sheet

Start of Block: Instructor Info

Your Name

_____

Course Title and Section

_____

Institution

O Isothermal Community College (1)

O Brevard College (2)

Milestone Assignment Number

O 1 (1)

O 2 (2)

O 3 (3)

O 4 (4)

End of Block: Instructor Info

Start of Block: Learning Outcomes and Course Data

What is the problem of practice you are trying to address (for example: student engagement, or turning in assignments)

_____

_____

_____

_____

_____

Learning Outcomes measured by this assignment?

_____

If you used a promising practice from our professional development session please choose the

category that best matches how you engaged with students (click all that apply)

O Classroom Atmosphere (8)

O Transparency in Teaching (9)

O Metacognition (learning about learning) (10)

Please select any/all teaching methods you have applied this semester.

☐ Checklists for assignments (1)

☐ Teaching assistant, peer mentor, supplemental instruction (2)

☐ Checking in with students/feedback (3)

☐ Rewarding attendance (4)

☐ Building classroom norms (early in the semester) (5)

☐ Collaboration in class: Study Groups (6)

☐ Classroom setup and routine, ritual for every class (7)

☐ Revised Syllabus (UDL, or other) (8)

☐ Setting clear learning outcomes and targets on assignments (9)

☐ Checking for student readiness and providing resources before assignments are offered (10)

☐ Contextualizing the classwork/objectives to make work relevant to individual student experiences (11)

☐ Offering more than one assignment option in the Milestone (12)

☐ Setting expectations: A clear example or target of what exemplary work looks like (13)

☐ Exam Wrappers (asking how students study, what they might do differently, etc.) (14)

☐ Reflection-Built in time to reflect on the learning process (15)

☐ Breaking down the step in an assignment (16)

Please rate your perceptions of student engagement at this point in the semester.

O Students were Highly Engaged (1)

O Students were Moderately Engaged (2)

O Student Engagement was static (3)

O Students were Moderately Less Engaged (4)

O Students were Highly Unengaged (5)

Total number of students enrolled in this class?

_____

Total number of students who completed the Milestone assignment?

_____

The number of students who earned an "A" on this assignment.

_____

The number of students who earned an "B" on this assignment.

_____

The number of students who earned an "C" on this assignment.

_____

The number of students who earned an "D" on this assignment.

_____

The number of students who earned an "F" on this assignment.

_____

End of Block: Learning Outcomes and Course Data

Start of Block: TABE Progress (Adult Basic Education Only)

How many students had a measurable skills gain during this milestone?

_____

How many students did not have a measurable skills gain during this milestone?

_____

End of Block: TABE Progress (Adult Basic Education Only)

Start of Block: Instructor Comments

Based on the information above, and your experience this semester, how, if at all, do you plan to alter your course? Please list areas of challenge or innovation.

_____

End of Block: Instructor Comments

Appendix C

1st Student Survey

Start of Block: Informed Consent

Welcome to the research study!   We are conducting a research study to understand how teaching practices impact academic outcomes, engagement, and perceptions. You will be presented with information related to coursework and asked to answer some questions about it. Please be assured that your responses will be kept anonymous. This survey will be conducted three times during the semester, and each survey should take you around five minutes to complete. There is no incentive to participate beyond helping us better understand how to improve teaching and

learning. There are no foreseeable risks to you in this research. There are no direct benefits to

you for participation, but this study may help us understand factors that contribute to student

success in gateway courses. Your participation in this research is voluntary. You have the right

to withdraw at any point during the study, for any reason, and without any prejudice by choosing

not to complete this survey. If you choose not to participate, there will be no impact on your

grades or academic standing. If you would like to contact the Principal Investigator in the study

to discuss this research, please e-mail _____. If you have concerns about your

treatment as a participant during this study, you may contact the chair of the Institutional Review

Board through the Office of Research Administration by calling_____. By

participating in this survey, you acknowledge that your participation in the study is voluntary,

you are 18 years of age, and that you are aware that you may choose to terminate your

participation in the study at any time and for any reason. IF YOU ARE UNDER 18, PLEASE

DO NOT COMPLETE THIS SURVEY. Instead, alert your instructor so that they may guide

you through an appropriate process. Please note that this survey will be best displayed on a

laptop or desktop computer. Some features may be less compatible for use on a mobile device.

O I consent, begin the study

O I do not consent, I do not wish to participate

End of Block: Informed Consent

Start of Block: Institutional Info

I attend (please choose one)

O Brevard College

O Isothermal Community College

End of Block: Institutional Info

Start of Block: Please rate each statement below.

I would rate my level of engagement in this course as...

O Very High

O High

O Moderate

O Low

O Very Low

I would rate my instructors level of engagement in this course as...

O Very High

O High

O Moderate

O Low

O Very Low

How important is your performance in this gateway course to your overall academic progress?

O Extremely important

O Very important

O Moderately important

O Slightly important

O Not at all important

Please rank the importance of the following teaching practices...

	Unimportant	Moderately Unimportant	Neither Important nor Unimportant	Moderately Important	Important
Frequent Feedback	O	O	O	O	O
One-on-one Meetings	O	O	O	O	O
Setting Clear Expectations	O	O	O	O	O

and Context					
Collaborative (Team) Assignments	O	O	O	O	O
Office Hours to Review Materials from Class	O	O	O	O	O
Additional Assignments that Help with Content Mastery	O	O	O	O	O
Review Sessions Outside of Class	O	O	O	O	O
Classroom Setup (physical space)	O	O	O	O	O
Timely (quick) Feedback from Instructor	O	O	O	O	O

Peer Support (With Experienced Students)	O	O	O	O	O
Teach Self-Regulating Behaviors	O	O	O	O	O
Integrating Technology in the Classroom	O	O	O	O	O
Engagement in the Classroom that Prompts Reflection	O	O	O	O	O

Please list any other classroom activities/practices that you perceive as being important to

student success in gateway courses.

_____

How important is the way material is taught to your ability to be successful?

O Extremely important

O Very important

O Moderately important

O Slightly important

O Not at all important

Please rate your level of anxiety related to this course at this time.

O Low-I wish to continue this work

O Minimal Anxiety

O Average Anxiety

O Above Average

O High Anxiety-I may need to drop this course

Please use this space to share any additional information regarding the delivery of this course (things that help or otherwise) that you would like the instructor or researchers to know.

_____

End of Block: Please rate each statement below.

Appendix D

1st and 2nd-Faculty Survey

Start of Block: Institution ID

I teach at (choose one)

O Brevard College

O Isothermal Community College

End of Block: Institution ID

Start of Block: Please rate each statement below.

What is your level of understanding pertaining to the definition of a gateway course?

O Extremely knowledgeable

O Very knowledgeable

O Moderately knowledgeable

O Slightly knowledgeable

O Not knowledgeable at all

At this time, I would rate my engagement in this course as...

O Very High

O High

O Moderate

O Low

O Very Low

At this time, I would rate student engagement in this course as

O Very High

O High

O Moderate

O Low

O Very Low

How important is student performance in this gateway course to a student's overall academic progress?

O Extremely important

O Very important

O Moderately important

O Slightly important

O Not at all important

Please rank the importance of the following teaching practices...

	Unimportant	Moderately Unimportant	Neither Important nor Unimportant	Moderately Important	Important
Frequent Feedback	O	O	O	O	O
One-on-one Meetings	O	O	O	O	O
Setting Clear Expectations and Context	O	O	O	O	O
Collaborative (Team) Assignments	O	O	O	O	O
Office Hours to Review Materials from Class	O	O	O	O	O
Additional Assignments that Help with Content Mastery	O	O	O	O	O
Review Sessions Outside of Class	O	O	O	O	O

Classroom Setup (physical space)	O	O	O	O	O
Timely (quick) Feedback from Instructor	O	O	O	O	O
Peer Support (With Experienced Students)	O	O	O	O	O
Teach Self-Regulating Behaviors	O	O	O	O	O
Integrating Technology in the Classroom	O	O	O	O	O
Engagement in the Classroom that Prompts Reflection	O	O	O	O	O

Please list any other practices that you perceive as being important to student success in gateway courses.

_____

At this time, how many of the teaching strategies above have you implemented in your

classroom?

_____

Please rate your belief in the value of research informed pedagogy and practice.

O Very strong

O Moderately Strong

O Neither Weak nor Strong

O Moderately Weak

O Very Weak

How important is the design of course delivery to student success?

O Extremely important

O Very important

O Moderately important

O Slightly important

O Not at all important

Please rate your level of anxiety related to this course.

O Low-I wish to continue this work

O Minimal Anxiety

O Average Anxiety

O Above Average

O High Anxiety-I may need to drop this course

Please rate your confidence level when applying research informed pedagogical strategies in gateway courses.

O Very High

O Moderately High

O Neither High nor Low

O Moderately Low

O Very low

Do you feel that by participating in this project you have developed new skill knowledge, leading to improved student learning outcomes, that are useful to your teaching by collaborating on this project?

O Definitely yes

O Probably yes

O Might or might not

O Probably not

O Definitely not

At this time, how can the research team support your efforts to increase student success ?

_____

Please use this space to share any additional information regarding the delivery of this course (things that help or otherwise) that you would like the researchers to know.

_____

End of Block: Please rate each statement below.

Appendix E

2nd and 3rd Student Survey

Start of Block: Institutional Info

I attend (please choose one)

O Brevard College

O Isothermal Community College

End of Block: Institutional Info

Start of Block: Please rate each statement below.

I know what a gateway course is.

O Definitely yes

O Probably yes

O Might or might not

O Probably not

O Definitely not

I would rate my level of engagement in this course as...

O Very High

O High

O Moderate

O Low

O Very Low

I would rate my instructors level of engagement in this course as...

O Very High

O High

O Moderate

O Low

O Very Low

How important is your performance in this gateway course to your overall academic progress?

O Extremely important

O Very important

O Moderately important

O Slightly important

O Not at all important

Please rank the importance of the following teaching practices...

	Unimportant	Moderately Unimportant	Neither Important nor Unimportant	Moderately Important	Important
Frequent	O	O	O	O	O

Feedback					
One-on-one Meetings	O	O	O	O	O
Setting Clear Expectations and Context	O	O	O	O	O
Collaborative (Team) Assignments	O	O	O	O	O
Office Hours to Review Materials from Class	O	O	O	O	O
Additional Assignments that Help with Content Mastery	O	O	O	O	O
Review Sessions Outside of Class	O	O	O	O	O
Classroom Setup (physical space)	O	O	O	O	O

Timely (quick) Feedback from Instructor	O	O	O	O	O
Peer Support (With Experienced Students)	O	O	O	O	O
Teach Self-Regulating Behaviors	O	O	O	O	O
Integrating Technology in the Classroom	O	O	O	O	O
Engagement in the Classroom that Prompts Reflection	O	O	O	O	O

Please list any other practices that you perceive as being important to student success in gateway

courses.

_____

How important is how the material is taught to your ability to be successful?

O Extremely important

O Very important

O Moderately important

O Slightly important

O Not at all important

Please rate your level of anxiety related to this course at this time.

O Low-I wish to continue this work

O Minimal Anxiety

O Average Anxiety

O Above Average

O High Anxiety-I may need to drop this course

Please use this space to share any additional information regarding the delivery of this course

(things that help or otherwise) that you would like the instructor or researchers to know.

_____

End of Block: Please rate each statement below.

Appendix F

Faculty Survey 3

Start of Block: Institution ID

I teach at (choose one)

O Brevard College

O Isothermal Community College

End of Block: Institution ID

Start of Block: Please rate each statement below.

What is your level of understanding pertaining to the definition of a gateway course?

O Extremely knowledgeable

O Very knowledgeable

O Moderately knowledgeable

O Slightly knowledgeable

O Not knowledgeable at all

At this time, I would rate my engagement in this course as...

O Very High

O High

O Moderate

O Low

O Very Low

At this time, I would rate student engagement in this course as

O Very High

O High

O Moderate

O Low

O Very Low

How important is student performance in this gateway course to a student's overall academic

progress?

O Extremely important

O Very important

O Moderately important

O Slightly important

O Not at all important

Please rank the importance of the following teaching practices...

	Unimportant	Moderately Unimportant	Neither Important nor Unimportant	Moderately Important	Important
Frequent Feedback	O	O	O	O	O
One-on-one Meetings	O	O	O	O	O
Setting Clear Expectations and Context	O	O	O	O	O
Collaborative (Team) Assignments	O	O	O	O	O
Office Hours to Review Materials from Class	O	O	O	O	O

Additional Assignments that Help with Content Mastery	O	O	O	O	O
Review Sessions Outside of Class	O	O	O	O	O
Classroom Setup (physical space)	O	O	O	O	O
Timely (quick) Feedback from Instructor	O	O	O	O	O
Peer Support (With Experienced Students)	O	O	O	O	O
Teach Self-Regulating Behaviors	O	O	O	O	O
Integrating Technology in the Classroom	O	O	O	O	O

Engagement in the Classroom that Prompts Reflection	O	O	O	O	O

Please list any other practices that you perceive as being important to student success in gateway courses.

_____

At this time, how many of the teaching strategies above have you implemented in your classroom?

_____

Please rate your belief in the value of research informed pedagogy and practice.

O Very strong

O Moderately Strong

O Neither Weak nor Strong

O Moderately Weak

O Very Weak

How important is the design of course delivery to student success?

O Extremely important

O Very important

O Moderately important

O Slightly important

O Not at all important

Please rate your level of anxiety related to this course.

O Low-I wish to continue this work

O Minimal Anxiety

O Average Anxiety

O Above Average

O High Anxiety-I may need to drop this course

Please rate your confidence level when applying research informed pedagogical strategies in gateway courses.

O Very High

O Moderately High

O Neither High nor Low

O Moderately Low

O Very low

Do you feel that by participating in this project you have developed new skill knowledge, leading to improved student learning outcomes, that are useful to your teaching by collaborating on this project?

O Definitely yes

O Probably yes

O Might or might not

O Probably not

O Definitely not

Do you plan to implement the research-informed pedagogical strategies from this research project beyond this semester?

O Definitely yes

O Probably yes

O Might or might not

O Probably not

O Definitely not

At this time, how can the research team support your efforts to increase student success ?

_____

Please use this space to share any additional information regarding the delivery of this course

(things that help or otherwise) that you would like the researchers to know.

_____

End of Block: Please rate each statement below.

Appendix G

Milestone Worksheet: Faculty

Instructions: Please complete 3 (or more) milestone worksheets using this template. They will be automatically saved here in the Google Drive. If a field/question is not applicable to your work just leave it blank.

Milestone date:
August 29-31_____

September 14-15_____

September 28-29_____

October 26-27_____

Other:_____

Institution:

Instructor: _____

Course Number_____

Section_____

1. What learning outcomes/target(s) are being measured?

   a. _____

   b. _____

   c. _____

   d. _____

   e. _____

2. Change Idea: Which pedagogies or practice from literature will you be utilizing as part of this Milestone?

3. Which problem of practice is your course change targeting (circle/highlight all that apply)?

   a. Assignment completion

   b. Attendance

   c. Engagement

   d. Other_____

4. How will the learning outcome be measured?

   a. Points (Scale 1-10)

   b. Percentages (0-100%)

   c. Pass/Fail

       d. Retention/Persistence_____

       e. TABE Test Score

       f. Other_____

5. What score denotes satisfactory progress? What score indicates support is needed?

       a. Satisfactory:_____

       b. Support Needed:_____

6. What support materials and/or services will be available to the student if support is needed?

       a. _____

       b. _____

       c. _____

            i.   Where will it be available?

                1. Online_____

                2. Online/ELC/Student Success (on campus)_____

                3. Other_____

7. Will the support assignment count as a re-grade, or alter the original assignment grade in some way? If so, how?

       a. Yes_____

                        b. No_____

       c. Grade adjustment details:_____

8. How does the need for support get communicated to support services and students?

       a. Via Email_____

       b. LMS Message_____

       c. Other _____

9. Once the support assignment is complete, what action will be taken by the faculty ?

       a. Separate assignment that is Pass/Fail_____

       b. Grade adjustment_____

       c. Follow-up email through LMS_____

       d. None_____

Other Notes:

Appendix H

Final 2x2 Output Tables

Bio105final * Bio105finalgrade Crosstabulation

Count

		Bio105finalgrade		Total
		.00	1.00	
Bio105frnal	F	4	42	46
	H	97	197	294
Total		101	239	340

BIO120final * Bio120finalgrade Crosstabulation

Count

		Bio120finalgrade		
		.00	1.00	Total
BIO120final	F	7	26	33
	H	169	191	360
Total		176	217	393

ENG111Final * ENG111Finalgrade Crosstabulation

Count

		ENG111Finalgrade		
		.00	1.00	Total
ENG111Final	F	10	49	59
	H	227	931	1158
Total		237	980	1217

EXS101final * EXS110finalgrades Crosstabulation

Count

		EXS110finalgrades		
		.00	1.00	Total
EXS101final	F	8	41	49
	H	42	145	187
Total		50	186	236

MAT100final * MAT100finalgrade Crosstabulation

Count

		MAT100finalgrade		
		.00	1.00	Total
MAT100final	F	2	13	15
	H	71	215	286
Total		73	228	301

MAT141final * MAT141Finalgrade Crosstabulation

Count

		MAT141Finalgrade		Total
		.00	1.00	
MAT141final	F	8	18	26
	H	105	355	460
Total		113	373	486

PSYFinal * PSYfinalgrades Crosstabulation

Count

		PSYfinalgrades		Total
		.00	1.00	
PSYFinal	F	10	67	77
	H	118	322	440
Total		128	389	517

ABE * ABEHistMSG Crosstabulation

Count

		ABEHistMSG		Total
		.00	1.00	
ABE	F	5	8	13
	H	652	522	1174
Total		657	530	1187

AHMath2 * AHMath2Hist Crosstabulation

Count

		AHMath2Hist		Total
		.00	1.00	
AHMath2	F	1	2	3
	H	7	16	23
Total		8	18	26