RESPONSIVE EVALUATION OF A COMMUNITY COLLEGE MATHEMATICS LABORATORY: A DISSERTATION IN PRACTICE

by

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Dedication

I dedicate this research to my support system—God, my family, and a few others—for their patience, encouragement, and love throughout this process.

Even if I felt like giving up, they were always there.
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My appreciation is extended to Dr. Carla Thompson and my committee, who supported me and cheered me on at times when I thought I would give up during this process. Ms. Lucrecia Burnett always encouraged me to keep going and always had a "smile" on her face.
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Executive Summary

This dissertation in practice (DIP), responsive evaluation (RE) explored relationships of the Faulkner Academic Math Excellence (FAME) Laboratory characteristics and specific perceptions of students enrolled in developmental mathematics education courses at a rural community college in Alabama's southeastern region. This program evaluation examined information surrounding the effectiveness of the FAME Lab program and service activities housed within a two-year community college. The study explored perceptions of students within a community college developmental mathematics education program relative to three areas of focus: (a) students' expressed access and use of the FAME Lab program services, (b) students' perceptions of the influence of the FAME Lab program services relative to academic performance levels, and (c) students' perceived value of the FAME Lab program relative to successes in developmental math courses. The researcher performed an extensive review of the literature and identified a critical problem of low numbers of students successfully completing developmental mathematics courses among colleges across the United States as a pervasive challenge, uniquely identified within community colleges and evidenced by 96% of colleges across the country requiring remediation courses, primarily in mathematics (Butrymowicz, 2017). The participants in the study were community college developmental education students and faculty of the community college. A potential limitation of this study includes researcher bias. The magnitude of the problem identified in the literature provided the impetus for the investigation and aligned with the nature of the meaning and purpose for using the DIP, explicitly recognizing an existing problem in practice and performing a study aligned with the need acknowledged by the problem in practice. The Faulkner Academic Math Excellence (FAME) Laboratory program exemplifies and aligns with the type of intervention programs reflective of the remediation programs that colleges across the United States are utilizing to curb or remedy the problem of low numbers of students successfully completing developmental mathematics courses. The researcher communicated with the Vice-President of Instruction and the Math Division Chair and received approval to conduct the DIP study. The researcher created a questionnaire for the student participants and conducted a RE of the FAME Lab program to respond to the problem defined for investigation. The current study provided a practitioner approach to examining the problem by incorporating the use of the RE model (Stake, 2014) to discern the problem within a focused setting, explicitly utilizing the FAME Lab program within a two-year college located in the southeastern region of the United States. The use of the RE protocol provided the researcher with strategies to inform results focused on three areas of consideration: (a) the examination of program activities rather than program goals or intents; (b) the acquisition of students' needs, reactions, and information rather than college leaders' intentions or purposes; and (c) the reporting of differing perspectives in determining the success and failure of the program. Based on the researcher's critical use of the RE protocol, a 12-step implementation plan for the FAME Lab program to assist students in attaining success within developmental mathematics was provided to college officials and are is provided for consideration by other developmental math programs at colleges across the United States. These 12 considerations, presented in Chapter 5, coupled with additional discussions of study results, add to the body of literature supporting students' preparation for entering college mathematics programs, a practitioner problem pervasive in colleges across the United States. The study will inform and advance the professional practice by informing the implementation of developmental mathematics education for students who do not complete developmental mathematics courses successfully.
Chapter 1: Introduction

The FAME Laboratory began as a program within a two-year college located in the southeastern region of the United States. The FAME Lab’s initial purpose is to help support two-year college students as they work toward improving their mathematics scores and skills. The institution created the FAME Lab because of students' low success rates in mathematics courses within the two-year college, the high number of student withdrawals from mathematics courses at the college, and students' mathematical needs. The focus of the FAME Lab is developing students' competencies and attitudes toward beginning mathematics courses, commonly known as developmental mathematics courses identified as Elementary Algebra (MTH098), Intermediate Algebra (MTH100), and Pre-Calculus Algebra (MTH112). The FAME Lab is available to assist students enrolled in these high-risk mathematics courses and prepare students to move forward in their mathematics prerequisite courses for various two-year college programs.

More than 10 years ago, Bailey (2009) described the problem of students entering colleges unprepared in mathematics and posed underprepared college students as a challenge and an opportunity for educators to rethink the purpose of developmental education programs in community colleges. This problem remains a pervasive challenge in the United States among community colleges, as evidenced by survey results of 911 four-year and two-year colleges in 2013–2014, reporting over 500,000 students or 96% of the colleges requiring remediation courses, primarily in mathematics (Butrymowicz, 2017). The purpose of this program evaluation was to explore relationships of the FAME Lab characteristics and specific perceptions of students enrolled in developmental math education courses at a rural community college in Alabama's southeastern region. The researcher utilized an evaluation model based on the RE model context (Stake, 2014). The first discussion section or introduction provides an overview of
the program evaluation process. The problem statement, purpose, and rationale for utilizing the RE model and the preliminary evaluation question that propelled the study is delivered in Chapter 1. Consisting of a full description of the RE approach, Chapter 1 also includes a description of the stakeholders for the evaluation, a description of the RE evaluation model, the limitations of the RE approach, the organization of the research study, and a summary of the chapter.

**Overview of Program Context for Evaluation**

This study identified and evaluated the value of a mathematics laboratory program located within a two-year college in the southeast region of the United States. The critical need for examining one community college's laboratory approach for addressing the problem of excessive numbers of students not succeeding in developmental algebra courses and students not being prepared for taking mathematics courses pertinent to their major fields of study is representative of hundreds of collegial institutions across the United States (Butrymowicz, 2017; Grimes & David, 1999; Hunter, 2017). The problem is that many developmental education students have difficulty with developmental mathematics courses in the community college. Literature pertinent to student success within developmental mathematics courses has emphasized the problem (Edgecombe, 2016).

The focus on a single two-year community college to examine the RE's contextual framework's problem may provide a model for other researchers to determine the effectiveness of multiple institutions and multiple regions, thereby enhancing the potential depth and breadth of the research's findings, exhibited within this first focused research-in-practice study. Understanding the RE model (Stake, 2014) from this context may provide future researchers a model for examining one institution at a time, thus identifying issues pertinent to specific student populations, locations, and identified regulations. This first step illustrated within the current
study will serve as a focused example for approaching a primary practitioner concern among colleges and universities. The RE model will responsively examine students in first and second-year programs of study who are not performing successfully in developmental mathematics courses, which is the foundation for many college programs of study (Hunter, 2017; Kreysa, 2006; Perin, 2018).

The researcher utilized Stake's RE in evaluating the program. The RE is a problem-based research approach aligned with the problem investigated in the study. Historically, the RE evolved from Stake's failure to answer specific questions with the current program evaluation. Stake began to realize that researchers should collect data in different methods and from various sources. Stake concluded that program evaluation consists of the researcher observing designated antecedents, transactions, and outcomes. Likewise, the researcher appropriately observed designated antecedents, transactions, and outcomes listed in Stake's prominent clock of events. The researcher utilized the prominent clock of events to conduct the study. RE is part of educational evaluation if (a) "it is oriented more specifically to curriculum practices than to plan objectives; (b) it needs input from the audience; and (c) it is demonstrated by the various interest experiences of the individuals interested in evaluating the progress and failure of the program" (Stake, 1976, p. 11). The current study utilized the following specific components of Stake's (1976) RE model: (a) the examination of program activities rather than program goals or intents; (b) the acquisition of students' needs, reactions, and information rather than college leaders' intentions or purposes; and (c) the reporting of perspectives in determining if the program is a success or failure. The research study examined the views of students' usage of developmental math education laboratory programs, perceptions of the FAME laboratory program, and students' perceptions of the FAME Laboratory service activities within the context of the three primary considerations of the RE model as posited by Stake (1976, 2014).
The FAME Lab is a result of the Community College's Quality Enhancement Plan (QEP, 2006). The QEP reported that many community college students were not performing well in Elementary Algebra (MTH098), Intermediate Algebra (MTH100), and Pre-Calculus Algebra (MTH112). Students take the ACT® or the ACCUPLACER® for course placement. The FAME Lab's goals are to change students' attitudes and improve the students' competencies in math. The college provided several strategies to reach these goals. The community college created the FAME Lab to offer supportive services for the students.

The current study focused on three specific mathematics courses generally required as prerequisites for virtually all professional or technical programs of study confronting college students within their first two years of their educational programs of study: Elementary Algebra (MTH098), Intermediate Algebra (MTH100), and Pre-Calculus Algebra (MTH112). Identifying and focusing on these three specific mathematics courses provides intense research and practice elements not evidenced in prior literature or previous studies. Prior literature has generally focused on remediation or developmental mathematics courses examined as a body of learning rather than monitoring Algebra's levels pertinent to most college programs of study (Hunter, 2017; Perin, 2018). Therefore, the current study provided a focused approach for researchers and practitioners for assisting in response to the adequate preparation of college students for successfully performing in mathematics courses relevant to their respective degree programs.

The current study has advanced the literature regarding developmental mathematics courses and students' needs for successfully completing Elementary Algebra (MTH098), Intermediate Algebra (MTH100), and Pre-Calculus Algebra (MTH112), thus establishing the foundational preparation for students entering college and identifying the type of work needed by researchers and professionals for correcting the problem of vast numbers of students unprepared for college mathematics.
Problem Statement

The problem addressed in this research is that many community college students in the United States enroll in community college underprepared, particularly in mathematics, and also register for more than one developmental education course (Butrymowicz, 2017; Grimes & David, 1999; Hunter, 2017; Kreysa, 2006; Perin, 2018). Twenty-one percent of students at a four-year college have completed two or more remedial courses. Forty-eight percent of public college students who began college in 2008–2009 completed more than two remedial courses within six years (Chen, 2016). This pattern increased in 2014–2015, with more than 500,000 students enrolling in remediation courses in 209 colleges in the United States (Butrymowicz, 2017). Many freshman students attending college attend community college (Cohen & Brawer, 1989; Ma & Baum, 2016; Monaghan & Attewell, 2015). The diverse population of students entering community colleges requires a diversified educational environment, which demands that community colleges expand their mission. The expansion on the mission of community colleges emphasizes programs designed to create a collaboration of the institution with community businesses; skills courses; high school equivalency degree programs (such as the GED degree); and job skills programs for recent high school graduates (Cohen & Brawer, 1989; Dougherty et al., 2017; Jacobs & Worth, 2019). Coupled with the expansion of course offerings, institutions need to address the encumbered numbers of college students enrolling in remediation courses, especially those with the need for remediation in mathematics (Joint Legislative Audit and Review Commission, 2017).

A disproportionate quantity of students attending community college enroll in developmental education courses (Ganga et al., 2018) propelled by multiple reasons: (a) developmental education classes cannot be transferred to other colleges and may not count for credit within specific programs of study, students may benefit from remedial instruction
(Attewell et al., 2006; King et al., 2017; Mazzariello et al., 2018); (b) students face other adversities and issues about college (Tinto, 1975); (c) students with no exposure to college expectations and requirements may have an increased potential for failure (Tinto, 1975); (d) developmental education programs may offer the support needed for students to adjust to the demands of college (Ganga et al., 2018). In essence, a substantial number of students enter college underprepared, with inadequate skills for a successful college career.

The number of underprepared students has prompted two-year and four-year colleges to implement new and redesigned types of remediation programs and services, exemplified by the Virginia Community Colleges (VCC) system. The VCC system of colleges is partnered with Pre K–12 schools to assist high school students in preparing for taking college-level mathematics and writing courses (Joint Legislative Audit and Review Commission, 2017). The VCC system has purposefully redesigned placement tests, created accommodating registration and financial aid options, and changed developmental education's focus by redesigning course curricula and course delivery options (Joint Legislative Audit and Review Commission, 2017).

The terms developmental education and remediation have been used interchangeably in past research (Boylan et al., 2017; King et al., 2017). Developmental education is a remediation curriculum for community college students who may have educational setbacks (Relles & Duncheon, 2018). Developmental education is a cycle of incorporating student resources, support, and courses to assist students in succeeding. Students take various remediation courses to complete developmental education. Remediation consists of strategies to help underprepared students acquire the skills and knowledge needed to move into college-level courses (Bailey et al., 2016). The researcher will use the term developmental education to describe the courses the student participants have taken.
Further, the term developmental education refers to the type of courses the student participants have taken. The development of multiple remediation methods is a primary concern for community college policymakers, administrators, and educators (Pruett & Absher, 2015). Compelling evidence indicates that remedial classes alone are not enough (Tinto, 1994); therefore, implementing institutional support programs is critical.

Research findings propose more than 60% of students enrolled in community college take remedial courses, with fewer than one-third of these college students in all likelihood likely to complete these courses (Attewell et al., 2006; Bahr, 2010; Bailey et al., 2010; Bettinger et al., 2013; Juszkiewicz, 2017; Palmer, 2016). Students who are not successful in the remedial courses accent the current study's need and support the problem's magnitude. When students cannot complete remediation courses, they cannot take college-level courses (Ganga et al., 2018). Students are also using their financial aid to pay for non-credit-bearing classes (Mokher et al., 2020). Recent attacks on developmental education by policy makers blame attrition on remediation (Boylan et al., 2017). Substantial resources are needed to help support developmental education.

Support systems exist within institutions to enable students to succeed in remedial classes; however, the existing trend of student attrition evidenced in the literature and practice identifies the vital need to evaluate programs focused on developmental education, especially in mathematics gateway courses. Remedial education alone cannot help students become successful. The comprehensive strategy and execution of developmental education need improvement (Bailey, 2009; King et al., 2017). Moreover, attacks on developmental education have pushed institutions to rethink programs and establish and invest in developing support systems such as supplemental instruction, accelerated classes, and learning communities (Jenkins & Cho, 2012; Jenkins et al., 2017; Lorenzo, 2015). The increase in the number of students
unprepared to attend college evolved into multiple types of remediation programs and developmental mathematics programs offered to incoming students.

In contrast, college officials have sought alternatives for this crisis. The current study is to identify and clarify the (a) challenges associated with the developmental education phenomenon and (b) contributors to the task of the high numbers of students unprepared in mathematics to enter college. The current study also provides a plan of action, spearheaded by the literature, for establishing the need and implementation of program evaluation for articulating and confronting the problem.

**Purpose and Rationale for Evaluation**

The purpose of this program evaluation was to explore relationships of the FAME Lab characteristics and specific perceptions of students enrolled in developmental math education courses at a rural community college in Alabama's southeastern region. The purpose and rationale for this program evaluation was to explore the issues and alternatives surrounding the crisis regarding students entering community colleges unprepared, especially in mathematics skills relative to one program's response to action delivered by a community college; thus the creation and operation of the FAME program laboratory. The researcher (practitioner) used Stake's RE (1976) in the study. This study's evaluation approach is a case study through observations, a questionnaire, and a collection of artifacts from the research site. The purpose and rationale for using the RE model involved three areas of contributing information pertinent to evaluation: (a) to add to the literature regarding the use of evaluation within the context of the problem explored for investigation; (b) to improve the practice of serving students with alternatives regarding entering community colleges unprepared in mathematics skills; (c) to provide evaluation options and outcomes for administrators and educators in decision-making for effectively assisting students in successfully conquering deficiencies and issues hampering their
successes in learning and performing in mathematics courses necessary for entering college programs of study. These three areas of focus were specifically outlined and explored by the evaluation plan initiated in the study.

The use of RE provided a strong foundation for adding to the literature regarding the need for evaluation of programs focused on remediation or developmental mathematics education for students entering two-year colleges, as exemplified within three perspectives: (a) Program evaluation studies reported in the literature have traditionally focused on quantitative evaluation approaches sometimes referred to as evidence-based policy studies, rather than qualitative or mixed methods research approaches exemplified by RE studies (Abma, 2005); (b) Literature depicting evaluation studies are often presented from the perspective of policymakers who have prompted the evaluation rather than providing an evaluative perspective stemming from stakeholders comprised of all persons affected by the problem and program evaluation considerations as evidenced by RE perspectives (Abma, 2005); and (c) RE model and application is an appropriate addition and response to literature focused on evaluations involving ambiguous contexts (Abma, 2005), the lack of knowledge concerning programs and success indicators for students struggling with mathematics and more precisely, the problem of students entering college unprepared in mathematics.

The use of RE within the current study may assist in improving practice as reflected by the following three components: (a) RE involves evaluating the critical problems found by stakeholders, involving the relevant people who are most likely to benefit from the outcomes of the assessment and linked to the results of practice; (b) RE encourages deliberate interactions and discussion between stakeholders to support a shared understanding of the problem and possible solutions (Greene & Abma, 2001); and (c) RE helps to enhance (Abma, 2005). The use of RE produced evaluation choices and results for administrators and educators in deciding how to
Effectively assist students in successfully resolving shortcomings and problems hampering their achievements in mathematics courses needed to enter college programs of study, as illustrated by the following three exemplars: (a) RE promotes the involvement of stakeholders in conversations, active interviews, and exchanges, and participation in frequent communications encouraging "buy-in" by all constituents involved in the decision-making and aimed at the "best" interest of all involved in the process (Greene & Abma, 2001); (b) RE emphasizes local input and knowledge from stakeholders to enable immediate use of information within the context of practitioners relative to a change in policy as appropriate (Abma, 2005); and (c) RE is useful in working with social action decisions (Abma, 2005); therefore, policies impacting the problem of students unprepared in mathematics for entering college aligns with a social issue as well as an educational problem, lending evidence for decision-making or policy changes as needed to combat the problem from a social and educational perspective.

The institution designed the FAME Laboratory program to establish the environment and program characteristics representative of this option for consideration as a viable approach for responding to students entering college unprepared in mathematics skills. The use of the RE model provided a three-fold overriding perspective for examining information germane to the creation, operation, and assessment of the FAME Lab program as follows: (a) the examination of program activities rather than program goals or intents; (b) the acquisition of students' needs, reactions, and information rather than college leaders' intentions or purposes; and (c) the documentation of differing viewpoints in determining if the program succeeds or fails (Stake, 1976, 2014). The FAME Lab's implied goal is to provide developmental education students with an academic foundation. The QEP (2006) stated, "the program focuses on helping our students excel in three mathematics courses, Elementary Algebra (MTH098), Intermediate Algebra (MTH100), and Pre-Calculus Algebra (MTH112)" (para. 2). The FAME Lab's mission is to
provide dedicated support to increase the achievement of underprepared students. The FAME Lab uses a comprehensive approach to work with academically underprepared students. Students receive computer tutorials, online supplemental instruction, and coursework resources. The lab's specialist also coordinates and provides a location for study groups, seminars, and tutorial sessions (Bailey, 2018).

**Evaluation Question**

Stake (1983) pointed out the need for specific evaluation questions to aid as a guide, as the evaluator focuses on the study. The use of the RE model provides for a three-fold overriding perspective for examining information pertinent to the creation, operation, and assessment of the FAME Lab program as follows: (a) the examination of program activities, rather than program goals or intents; (b) the acquisition of students' needs, reactions, and information, rather than college leaders' intentions or purposes; and (c) the documentation of differing perspectives in determining how and why the program may succeed or fail (Stake, 1976, 2014). These three perspectives utilized in the study within the RE framework were instrumental in determining the major research question of this program evaluation. The research's central question is the following: What are the perceptions of students about the FAME Laboratory program in meeting the needs of underprepared students enrolled in community colleges?

In addition to the central research question, the study examined three specific research evaluation questions:

**RQ1:** What influence does the FAME Lab tutoring program have on the self-perceived academic performance of developmental education students?

**RQ2:** What are the perceived factors influencing developmental education students' access and use of the FAME Lab?
**RQ3:** How do students perceive the value of the FAME Lab relative to developmental classes?

**Stakeholders for Evaluation and the Evaluation Approach**

The researcher contacted the FAME Lab stakeholders because of the first-hand knowledge of individuals within the research site. Stakeholders included the interim director of the FAME Lab, a math instructor, and student participants. The interim director's role in the study was to provide the researcher with information about the FAME Lab. The interim director, who is also the Math department chair, delegated one math instructor to oversee the operations of the FAME Lab. The math instructor's role in the study was to serve as a gatekeeper and provide information about the FAME Lab. The math instructor monitors the FAME Lab, supervises the tutors, and creates the tutor schedule for the FAME Lab. The student participants answered the questions provided on the questionnaire. Each stakeholder group has pertinent expertise and vested interest in the goals and function of the FAME Laboratory activities. Several contributing factors relate to the stakeholders' influence and roles in the evaluation.

Stake's (1976) RE model research approach is a process evaluation model. A process evaluation approach provides the researcher with a timeframe and the action plan for establishing the procedures appropriate to evaluate the data gathered during the study. Stake's (1976) RE framework provided the structure for determining the research's timeframe and the action plan for establishing the procedures appropriate to evaluate the gathered data during the study. Stake's (1976) RE (a) involved stakeholder participation, communication, and engagement (Abma, 2005); (b) produced knowledge within the context of stakeholders' discussions of evidence and needs; (c) provided the rationale for a vision for stakeholders relevant to the selected FAME Lab setting.
The RE approach focused on retrieving stakeholders’ responses/communications related to their perceptions of the FAME Lab's direct impact on policy and practice and retrieving responses of student participants and the interim director of FAME Lab as well as communications with the head of the mathematics department relative to the three evaluation questions posited for the investigation. The RE process proposed both general implications from work already completed and specific resulting information from the student participants’ responses within the study findings. The researcher gathered data through iterative cycles of investigating, observing, and reflecting on observations, as a plan for strategizing, improving, taking action, and then repeating the research (Stringer, n.d.). Responsive evaluation is a method in which an investigator measures the efficiency of an educational program. Stake's RE uses a step-by-step process to measure the effectiveness of a program.

**Limitations of the Evaluation**

This research study included several limitations. A limitation is a weakness or item that arises in the study, outside of the researcher's control (Creswell & Creswell, 2017). Limitations of the chosen research design approach for this study include access to the student participants, the type of student participants, bias of the researcher, and selection of the site.

Access to the study participants was a limitation for the researcher. Consequently, the participants were not able to meet for face-to-face interviews. Specifically, the researcher used other means to gather the data from the participants. As such, the researcher provided a questionnaire for the participants to complete. A limitation of the study consists of interpreting findings to only those perceptions, information, and communications from these specified stakeholders' participation. Specifically, the study focuses on studying developmental education students enrolled in a rural community college located in Alabama's southeastern region. Study participants were students who were currently or had previously enrolled in one or more
developmental education courses. After identifying this pool of students for participation, 23 students from this group participated in the study. The selected participants provided supportive information useful for the representation of the developmental education students at the institution. Adult education and dual enrollment students were not included in the study.

An additional potential limitation in this study is researcher bias (Creswell & Creswell, 2017). The researcher attempted to minimize bias and maintain objectivity within all research protocols. The researcher has past employment as a librarian for a community college; however, the researcher does not currently work for the community college included in this study. There are limitations to objectivity in procedures when the researcher created the research instrument for student participants at the community college. The researcher was an instructor for basic study skills and developmental reading classes. An additional limitation of the study is examining and presenting findings by the nature of the researcher's abilities and skills to perform the analysis (Theofanidis & Fountouki, 2018). The researcher accessed the FAME Lab at the community college used for the study. The study of only one community college may affect the research and merely reflects the participants' perceptions of one community college; therefore, caution should be taken when generalizing the study (Creswell & Milller, 2000). The identified limitations presented could establish a need for future studies.

**Organization of the Study**

The study's organization involves a five-chapter presentation of the concepts and events completed for accomplishing the DIP, using the RE program evaluation approach. The five chapters are organized according to the subsequent topics and content.

Chapter 1 provides an introduction and the overview of the program context for the RE plan of action, the problem statement, the purpose and rationale for the evaluation, evaluation
questions, a description of the stakeholders and the evaluation approach, the limitations of the evaluation, organization of the study and a chapter summary.

Chapter 2 includes an introduction and overview of the RE evaluation model with related literature, followed by the description of the program or policy context for evaluation with an articulation of the specific model of RE. It also includes related literature pertinent to the current study, followed by a chapter summary.

Chapter 3 presents an introduction to the focus and scope of the RE, including the study limitations and delimitations; the evaluation plan and data collection procedures; a description of the research site selection/setting, and research site; description of participants/data set/agency, and organization; a discussion of the ethical issues, along with the institutional review board (IRB) process, and consent forms pertinent to the study; a discussion of the researcher positionality; and a chapter summary.

Chapter 4 consists of an introduction, description of the participants, a critical analysis and evaluation of the findings, an in-depth discussion of the interpretation of the findings/results relative to informing practice, model, the advancement of the literature, and the determination of emergent patterns, followed by a chapter summary.

Chapter 5 delivers an introduction to a summary of the major findings of the study embedded within a summary of the entire research process, followed by the criteria and standards for making evaluative judgments, specified recommendations and implications for practice, meta-evaluation and evaluation standards, reflections on the evaluation process and ethical considerations, and a listing of the study limitations and a reflexivity commentary, followed by a chapter summary.
Chapter Summary

Chapter 1 provided the following areas of examination relative to the study: (a) an introduction to the chapter; (b) an overview of the program and context for the use of RE; (c) a detailed discussion of the problem statement; (d) a comprehensive presentation of the purpose and rationale for the RE approach; (e) the specific statement of the three-part evaluation question; (f) a description of the stakeholders and the aligned RE approach; (g) a listing and discussion of the limitations of the RE model and potential impact on the study; (h) a descriptive narrative of the organization of the five chapters included in this document; and (i) a chapter summary concluding Chapter 1.

Developmental education has served a purpose in positive ways for developmental education students since its inception (Christ, 1971). Many changes have occurred to help fulfill the goals of developmental education. Community colleges implemented various practices in the success of developmental education. The FAME Lab has implemented a method for assisting an institution in helping students succeed. Many students are underprepared to take college courses due to the lack of necessary academic skills. Students who attend community colleges have a higher rate, about 42%, of taking developmental courses, according to Ma and Baum (2016). Developmental education classes are for incoming first-year students who do not attain appropriate passing scores on the ACT (American College Testing). Institutions may use other placement tests such as COMPASS® or ACCUPLACER® Online (Hughes & Scott-Clayton, 2011) as designated by each institution. The Center for Community College Student Engagement (CCCSE, 2016) reports 87% of students entering community college take a standardized test (CCCSE, 2016). The current study may help community college administration improve and develop services to align more closely with student preferences or needs and help raise graduation and retention rates. Additionally, the interviews and data collected may help describe
a specific student success center's impact and assist community college students underprepared for college. There has been an increasing interest in higher education student services, especially in community colleges (Bailey et al., 2015; Cooper, 2010). Researchers posit that students who receive academic and social support have a higher opportunity to succeed in college. (Strayhorn, 2018; Tinto, 1999, 2006, 2012; Zhao & Kuh, 2004). The strategies listed above are in the related literature discussed in Chapter 2.
Chapter 2: Literature Review (Evaluation Model and Literature)

This chapter provides a literature review of the pertinent information and prior research retrieved to examine the problem under investigation and research questions initiated by the problem statement, as indicated in Chapter 1. Stake's (1976) RE model constructed the posited problem for inquiry and the accompanying research questions. Stake's RE model was the appropriate and relevant approach to stakeholders' interests in responding to students entering college prepared to take mathematics courses. Stake (1976) defined RE as an assessment based on people's observations and reactions through an evaluative process.

Stake's evaluation method provides three perspectives utilized in the study for examining the FAME Lab. Stake's program evaluation includes (a) the examination of program activities rather than program goals or intents; (b) the acquisition of students' needs, reactions, and information rather than college leaders' intentions or purposes; and (c) the reporting of divergent perspectives in determining if the program will succeed or fail (Stake, 1976). These three perspectives presented in Chapter 1 and utilized in the study are within the RE framework and determine the central research question of the program evaluation. The purpose of this program evaluation was to explore relationships of the FAME Lab characteristics and specific perceptions of students enrolled in developmental math education courses at a rural community college in Alabama's southeastern region. The evaluation study's central research question is as follows: What are the perceptions of students about the FAME Laboratory program in meeting the needs of underprepared students enrolled in community colleges? In addition to the central research question, the study examined three specific research evaluation questions:

**RQ1:** What influence does the FAME Lab tutoring program have on the self-perceived academic performance of developmental education students?
**RQ2:** What are the perceived factors influencing developmental education students' access and use of the FAME Lab?

**RQ3:** How do students perceive the value of the FAME Lab relative to developmental classes?

Literature specific to the RE model and pertinent to apprising these three evaluation questions comprises the information presented in this literature review. Particular topics discussed within Chapter 2 are (a) an introduction, (b) an overview of the evaluation model and related literature, (c) a description of the program context focused on the FAME Lab relative to the perceived value of the FAME Lab as a student success center and, (d) the Chapter Summary. This study uses Stake's RE model to review students' perspectives, review the current policies in place for the FAME Lab, and examine the data discovered from the observations, questionnaire, and a collection of artifacts from a rural community college in Alabama's southeastern region.

**Overview of Evaluation Model and Related Literature**

This section provides an overview of the RE model (Stake, 1976) and the related literature associated with the model utilized within the study. Specific areas of focused discussion within this section include the following: (a) the history and development of the RE model, the relationship of the RE model and case study method within the research design; (b) the problem-solving approach that was used for the analysis; and (c) the context model concerning the study as an intensive discussion of the available literature emphasizing the significant issues related to the problem. Each of these areas is presented relative to the learning assistance center –FAME Lab– as consideration for evaluation.

Stake's RE model began as an idea that was nothing new to the research world. In 1965, there were only two programs designated to evaluate educational programs. Stake and other colleagues reviewed the current educational evaluation programs and purveyed the idea of RE.
Responsive evaluation is the answer to evaluating educational programs. Stake (1976) believed the following about RE:

Responsive evaluation stresses the difference between preordinate and responsive methods of evaluation. An evaluator's critical role is made scarcely tolerable by the fact that he does not have to solve this equation in any numerical way or receive a descriptive summary score but merely wants to make a detailed explanation of what the program is considered to be, with valuable references to the happiness and frustration that individuals have reasonably chosen to feel towards it. Any individual client may want more than this, but I agree that this fulfills the assessment report's minimum definition. (p. 9)

Stake (1976) discussed various evaluation models in his paper, particularly RE, during the early stages of program evaluation. He speaks specifically about the Institutional Self-Study by Staff Approach and other research strategies that focus on student performance. Stake examined Cronbach's (1963), Stufflebeam's (1971), and Scriven's (2012) preference to learn more about curriculum development. The Experimental school program and the adversarial procedures in obtaining evidence of program quality were two types of program evaluation. Stake was concerned with distinguishing between preordinate evaluation and RE. Stake emphasized there is no perfect evaluation process, but he chose to use an evaluation process that provides a service and is useful to each program. Robert Stake believed RE would hopefully increase the findings' usefulness to persons in and around the program. Stake thought human beings are the best instruments to use in an evaluation. Incidentally, Stake's responsive assessment incorporates a step-by-step approach.

Various past research includes Stake's RE. Past research includes topics of information science (Stake, 2014), higher education teaching practices (Kirschling et al., 1995), and
professional conferences (Spiegel et al., 1999). Some additional past research that utilizes Stake's RE model includes evaluating public service organizations (Brix et al., 2017). The health field has used RE by evaluating policy interventions based on policymakers (Abma, 2005). Van der Knaap (2006) discussed in his study the importance of the assessment of policies and application of performance indicators when conducting an evaluation. Van der Knaap (2006) believed institutions should have conversations with the personnel about evaluating the policies. Organizations make responsive changes from listening to the conversations of the stakeholders.

Cambourne and Turbill (1994) researched the evaluation of literacy through RE. The book considers the views of teachers, administrators, and researchers applying the RE model to help them gather and interpret the information they collect consistently and cohesively. Spiegel et al. (1999) used Stake's model to evaluate a professional conference where the evaluators participated in the conference and subsequently participated in the evaluation. Stake's (1976) RE has been used in other areas of education. Responsive evaluation would also apply in the health and medical field, clinical skills evaluation, assessment training (Curran et al., 2003), and health promotion (Abma, 2005). These uses indicate that RE reveals the effectiveness and worth of programs.

The problem-solving approach for examining the RE model (Stake, 1976) is the case study method within this research. The RE model is a pertinent discussion for establishing the model's interrelationships and the technique for data analyses as appropriate for supporting study findings. The RE model emphasizes community college students' perceptions of using a specific learning assistance center to highlight students' mathematics assistance. Stake's (1976) RE approach captures the students' responses to the use of mathematics success. The researcher understood the issues raised by the participants of the study with the RE. To obtain an in-depth knowledge of the study participants' responses to the mathematics success center, the researcher
conducted a thorough literature review of various texts. The researcher also completed an examination of the major works written by Stake (1976).

This literature review includes Stake's (1976) RE clock of prominent events. Stake's clock events present each occurrence or step in which the researcher performs the research tasks. Examining the program evaluation approaches' prominent events may give the researcher a more in-depth look at the program to increase the usefulness of the findings for individuals involved in the program. Listed below are the prominent events in the program evaluation.

12:00 Have a dialogue with clientele, staff, audiences
1:00 Recognize the scope of the program
2:00 Summary of activities of the program
3:00 Determine purposes and concerns
4:00 Theorize issues and problems
5:00 Recognize data essentials, concerns
6:00 Choose observers, judges, resources if any
7:00 Observe designated qualifications, connections, and outcomes
8:00 Create the idea; prepare depictions, case studies
9:00 Confirm or attempt to disconfirm
10:00 Examine and organize for audience use
11:00 Create official reports, if any

In the RE clock, evaluators may use any of the clock's times simultaneously, repeatedly, or in any order (Stake, 2004).

Stake (1976) recommended that the researcher use the RE to be involved and interactive by communicating with the primary stakeholders. The analyst is often interested in exploring events on-site through practical methods, including getting the stakeholders' opinions. Many
evaluation plans are more pre-ordinate than RE and emphasize (a) goals, (b) application of objective tests, (c) ideals held by program personnel, and (d) research-type reports. Responsive evaluation depends more on natural communication rather than formal communication (Stake, 2014). A case study (Stake, 2003) approach is appropriate for this study because a case study comprises an RE approach focusing on the FAME Lab and the specific activities in this individual laboratory center (Acee et al., 2017; Johnson & Stake, 1996; Merriam, 1998; Patton, 1990). The researcher used the case study research approach for the data collection conducted through observations, questionnaires, and artifacts. The researcher used Stake's (1976) responsive model in evaluating the program of the FAME Lab for supporting student success in mathematics. Stake (1976) believed the RE model is an approach appropriate for assessing programs by sacrificing the design to improve its effectiveness. As a means for examining relationships, behaviors, attitudes, motivations, and stressors within the institutional setting, the researcher applied a case study design (Hancock & Algozzine, 2017). Johnson and Stake (1996) identified the case study as an aid for the researcher and stakeholders to evaluate a program and provide an in-depth understanding of student success. The current research project involved a case study emphasizing a specific area and its situation within an institution (Lune & Berg, 2012). A case study is applied when a researcher is asking "why" and "how." A case study also focuses on real-life occurrences (Liang, 2019).

Johnson and Stake's (1996) emphasis on the case study method is considered an integral part of RE’s critical data collection process. Responsive evaluation reveals situations and characteristics of programs to enable a clear understanding of the program (Stake, 2004). Essential aspects of RE include interviewing people, analyzing documents, and examining "vicarious experiences" (Stake, 2004, p. 93). Eisenhardt (1989) stated that "Case studies usually incorporate techniques of data gathering, such as archives, interviews, questionnaires and
findings" (p. 534). Follow-up interviews may assist the evaluation process, evoking new interactions and conversations among the interviewees (Brod et al., 2009; Brower et al., 2017; Kallio et al., 2016; Rubin & Rubin, 2005).

Stake (1976) revealed the following characteristics of RE as educational evaluation: (1) if the evaluation process refers to the program activities instead of the program intentions, (2) if the evaluation relies on the audience for information, and (3) if the report of the success or failure of the program involves various people's thoughts and opinions (Stake, 1976, 1983). Stake (1976) explained the evaluation of a program is to record events; record the change in students; support in the decision-making process; seek an understanding of the program; and facilitate remediation. The researcher examined each of these considerations within the framework of integrating the RE case study of the FAME Lab.

Students who register for community college courses sometimes enroll in developmental education classes (Bracco et al., 2015; Lewis, 2015). The creation of these classes is for students who need additional assistance (Boatman, & Long, 2018; Boylan & Trawick, 2015; Maxwell, 1994). Boylan and Bonham stated developmental education integrates remedial academic classes and support programs, focusing on the concepts of adult literacy (andragogy) and growth. Instructional support in learning assistance centers provides additional aid for students. There have been several phases in educational access for students from the 1600s to the present day. Clientele began with privileged white males as nontraditional and general students (Arendale, 2004; Walker, 2016). Tutoring started as the focus of learning assistance centers.

Student services then increased involvement in developmental education, learning centers, and learning enrichment. Learning Assistance Centers (LACs) evolved because of these efforts. LACs provide students with study strategies and supplemental enrichment activities to increase retention (Arendale, 2002a; McCabe, 2018; Walker, 2016). According to Arendale
(2002a), the learning assistance centers offer a blueprint for later learning and teaching centers set up in several American colleges in the 1990s to support students and faculty members. These centers concentrate not only on students developing their learning skills through comprehensive instructional materials, but also as sites for faculty development (Arendale, 2005; Hatch & Bohlig, 2016).

Learning centers share a joint mission or purpose. This mission is to provide supportive, supplemental, and enrichment learning opportunities to any student experiencing academic issues (Christ, 1971; Payne et al., 2017). A literature review revealed the relationships concerning developmental education college students’ academic success, advancement, graduation, and students’ departures. The connection relates to students’ use and participation rates within learning assistance centers (Casazza & Silverman, 1996; Comeaux, 2015; Franklin & Blankenberger, 2016). Individual students or groups may receive tutoring from the learning assistance center by professional or peer tutors. These students work at their own pace (Kim, 2015; Koski & Levin, 1998; Marx et al., 2016). Many developmental education students are also required to attend or use learning assistance centers (Boylan, 2002; Brower et al., 2018; Scrivener et al., 2015).

O’Banion (1999) believed that each institution is a learning institution providing convenient learning for students. He identified six principles of the ideal learning center:

- creates a change in the learners;
- involves learners in the process with the learners being accountable for the choices they make;
- generates and provides many learning options;
- helps learners collaborate with their peers in various educational activities;
- succeeds when improvements and growth in academics come into realization;
defines the facilitators' role (O'Banion, 1999).

O'Banion (1999) suggested transformative thoughts could be practical if applied to fidelity, not only within learning or learning assistance centers but within the institution as a whole.

Community colleges have established tutoring services, workshops, academic supports, and other strategies for students with the primary goal of success (Ari et al., 2017; Boylan et al., 1999; Manalo & Leader, 2007; Walker, 2016). LACs are believed by many to be essential for the academic success of community college students as developmental students also participate in transition and vocational classes when enrolling in developmental courses (Higbee et al., 2005; McKinney et al., 2019). Current literature focused on LACs and student successes are discussed in this chapter to align with the DIP model (Perry, 2015; Storey & Maughan, 2016; Watson, & Mochizuki, 2017). The purpose of this literature review is to notify the reader of the ideas and significant literature currently published about the community college experience, institutional assistance, developmental education, and professional development concerning LACs. A discussion of these topics is necessary because of the contribution to understanding the research problem studied. The researcher will explain Tinto's (1975) model of departure and Braxton et al.'s (2004) thoughts on student departure and how it applies to the topic.

Stake's RE (1976) concentrates on program evaluation. Responsive evaluation may be a large or small study (Anh, 2018). The program review may contain three aspects: evaluator commissioned to do the work; an audience or clients to assist the evaluator; and communications with the audiences or clients (Christ, 1971, p. 5). Stake preferred to use an evaluation program that performs a service. In this study, to increase the usefulness of the data discovered, the researcher conducted a service to assist the institution. In RE, the researcher learns how to react and observe.
The study conducted in this research considered responsive evaluation because it meets the RE criteria according to Stake (1976), in that (a) it points more directly to activities in the program rather than the intents of the program, (b) it responds to the knowledge criteria of the public, and (c) it reports if the program succeeds or fails. Stake (1976) mentioned several responsibilities for a responsive evaluator:

- Plans to observe and negotiate
- Arranges for several others to observe the situation
- Uses this information to prepare brief stories, descriptions, and graphs
- Determines what the audience values
- Gathers the value of information from various individuals after checking the quality of the records
- Gathers responses from the personnel to ensure the accuracy of their responses
- Gets the reactions experts about the findings
- Gets audience members' reactions about the significance of the evaluators' findings while recording the action and reactions
- Chooses media available to its viewers to increase the probability and quality of contact; and
- Prepares a report for the audience

Responsive evaluation emphasizes an assessment carried out in contexts where teaching and learning practices occur through experiences and observations rather than by paying more attention to predetermined problems. According to Stake (1976), program evaluation may bring about different purposes. These purposes may be to record events and changes in the students, observe the institution's strength, assist in administrative decision-making, and increase the
understanding of curriculum and instruction. The responsive evaluation focuses on local interests in a setting. The responsive evaluator is to become personally acquainted and familiar with the community and stakeholders in that setting while considering the point of view for looking at what is evaluated (Stake, 2014). Stake revealed that an evaluation aims to record events occurring in the program, record changes in the program, and record the students' opinions and actions. Responsive evaluation should also help personnel make program change decisions, understand the program, and seek the program's remediation.

**Community College Experience**

Developmental education is a specific concern to community colleges because more underprepared students enroll in community colleges than universities (Bailey & Alfonso, 2005; Lewis, 2015). During open enrollment, underprepared students are urged by college advisors to avoid selecting a university and choose a community college whereby students may access formative training or remedial courses (Gajewski & Mather, 2015). Students enrolled in remedial classes will require extended time to complete their degrees, associated with a decrease in the likelihood that the remedial students will graduate (Adelman, 1999; Daugherty et al., 2018). Study results show that effective developmental education systems support students in alleviating challenges in schools (Bettinger et al., 2013; Gibbs, 1994; Jaggars et al., 2015).

Supplemental instruction has been utilized most as the received aid of formative training models in postsecondary instruction for developmental education students (Arendale, 2004; Grizzard, 2019; Skoglund et al., 2018). Other research efforts have indicated findings supporting the practical benefit of LACs. For example, efficient learning services significantly correlated with student achievement and student success (Guarcello et al., 2017; Starks, 1989). Various factors reported in the literature depict possible reasons students choose community colleges (Cohen & Brawer, 1989; Juszkiewicz, 2017; Lukszo & Hayes, 2019). Students select community
colleges because of academic ability and affordability (Levin & García, 2018). Undeniably, community college students often come from low-income households when compared with university students. Community college students are more likely to be employed while enrolled in school and often enroll with poor academic abilities (Gooden & Matus-Grossman, 2002; Holzer & Baum, 2017; Levin & García, 2018).

Often, students entering a community college eventually transfer to a university. This approach to attending college may save the students and parents money for two years. Students then transfer their community college credits to a university or four-year college. The National Center for Education Statistics (2018) reported the national average for one-year tuition at a four-year institution is $18,632. Conversely, the average community college tuition for one year is $9,586. More than a quarter of 2012 U. S. college graduates did not possess college readiness skills on all four ACT subject test benchmarks and 60% of students tested missed the mark in at least two of the four subjects (NCES, 2018). Students who may not have the funds to attend a four-year college may need extra assistance with study and job skills (Stewart et al., 2016; Taylor & Lepper, 2018; Twombly & Grubb, 2001). Researchers recognize that students elect to attend the first years at community college to facilitate an efficient university transfer. Further, students may choose community colleges to assist in advancements within their career plans (Carrico et al., 2019; Hoachlander et al., 2003). Students may seek English language skills or personal enrichment opportunities.

An examination of the literature on factors that influence students studying at community colleges is pertinent to the proposed study of a rural community college located on Alabama's southeastern region. According to the Institutional Student Profile from the Alabama Commission on Higher Education (ACHE, 2018), these students were either full-time students (46.4%) or part-time students (53.6%). The ACHE (2018) profile also included the averages for
each ethnicity. There were 7,422 students enrolled. Of the enrollment, 495 students participated in a developmental mathematics course. These demographics include 7,085 In-State Resident students; 335 Out-of-State Residents; 7,420 U.S. students; 2 International students; 3,099 Male students; 4,323 female students; 4,920 Caucasian students; 1,753 African-American students; and 749 other ethnicities. The student-faculty ratio is 22 to 1. Notably, 1,581 students did not receive financial aid. Nationally, enrollment of community college students has decreased since 2012 (Juszkiewicz, 2017).

The Alabama Community College System, located in the southeastern region of the United States, consists of 27 institutions – including 21 community colleges, four technical colleges, and two workforce training agencies. According to the National Center for Education Statistics (2018), the Alabama Community College System includes more than 200 degrees, certificates, and short-term certificates available within the Allied Health Curriculum. The degree programs at the rural community college located in Alabama's southeastern region consist of 44 Business, Management, and Marketing degrees. Additionally, twenty-two related Support Services degrees, seven Computer Science and Information Sciences degrees, 64 Engineering Technology and Engineering-Related Fields, and 164 Health Professions and Related Programs are available at the college. The average annual tuition for 2018–2019, to include college fees was $4,740 (National Center for Education Statistics, 2018). Students enrolling in the rural community college in Alabama's southeastern region may face some challenges. These challenges may include working; balancing family obligations (Walker & Okpala, 2017); first-generation (Hunter, 2017); and lacking preparedness.

The college experience for students is essential for college retention. There is a need for a positive college experience because it will help students reach their individual goals. While a positive college experience is beneficial for the student, it is also advantageous to the college.
Institutions have an obligation to their students. Thus, colleges will achieve their goals by encouraging positive skills and services for students to be successful. Each department is invaluable in creating a positive experience. Developmental education with remedial courses is a positive step in assisting underprepared students. The entire college must support the efforts of the LACs to work as a team for recruiting, retention, and ultimately graduation.

**Developmental Education**

Developmental education has transformed from its humble beginnings from the early 1800s to more complex descriptors in 2017. Perin (2018) expressed the following consideration concerning developmental education: various colleges, especially two-year institutions or community colleges, work with an increase of instructional support, to serve those students in developmental education. As Boylan and Saxon (1999) asserted, "Developmental education not only focuses on optimizing student academic success, it also addresses "several non-cognitive or developmental" causes, such as control locus, attitudes towards learning, self-conception, flexibility, desire to receive support, and a range of other variables that have little to do with student intelligence or academic abilities” (p. 7). Previous research efforts indicate developmental education has been beneficial to the school, students, and the community (Arendale, 2002; Boatman & Long, 2018; Boylan et al., 1999; Scrivener et al., 2015); however, students placed in developmental education courses, may or may not be successful. It is essential to study developmental education's effects because 68% of community college students and 40% of public four-year college students take developmental courses (Rutschow et al., 2019). Even when officials mandate students to enroll in developmental classes, developmental education is not always practical (Burley et al., 2001; Twombly & Grubb, 2001).

Developmental education classes alone are not a remedy for student success (Uretsky et al., 2019). There are reports of improved grades and high satisfaction levels with tutoring.
services in particular, and some evidence of tutoring services is related to increased persistence (Feldman & Astin, 1994; Osborne et al., 2019; Twombly & Grubb, 2001). According to the Beginning Post-Secondary Students (BPS) 6-year follow-up results for 2009, about 68% of public community college students enroll in one or more developmental education courses within six years after enrolling in college (Scott-Clayton & Rodriguez, 2015). Developmental education is increasingly common among students and relies on student development through academic and social learning aspects. Freshman seminar courses, supplemental instruction, peer learning communities, and paired courses are research-based alternatives to developmental classes (Casazza & Silverman, 1996). Students are provided with services on campus to help them reach the level of competency in all classes. These services help students become prepared academically and personally, thereby ultimately assisting those students toward graduation.

Students who begin their academic careers at a community college taking necessary study skills or developmental education classes may not reach their educational objectives (Barnes & Piland, 2010). A traditional long sequence of remediation results in the question of the effectiveness of meeting students' needs with low math academic preparation (Xu & Dadgar, 2018).

The typical process for newly enrolled two-year college students consists of the college administering the first-year assessment to new students to help institutions decide whether students require placement in developmental education classes. Colleges also create schedules in which students are placed in courses appropriately aligned with their respective placement test results (Hugo, 2007). Placement tests assess reading, writing, and mathematics, as well as English as a second language. American College Testing's (ACT) COMPASS® or the Educational Testing Service's ACCUPLACER® was used by 97% of the institutions, with many of these universities using COMPASS® (Gerlaugh et al., 2007). The COMPASS® and ACCUPLACER® are used by many colleges as a single indicator to place students into various
developmental education programs (Bailey et al., 2010). In a study completed by Rutschow et al. (2019) for the Center for the Analysis of Postsecondary Readiness (CAPR) in 2016, 99% of the colleges surveyed used some form of standardized testing to determine college readiness in community colleges. In 2018, 18.5% of Alabama's students were prepared for college mathematics, as specified by ACT. Nationally in 2018, 20.5% of Alabama's students were ready for college math.

**Developmental Math Education**

Institutions have worked toward creating a new methodology for developmental math instruction. According to a study by Rutschow et al. (2019) for the CAPR, the study recognizes that remedial mathematics is a barrier to college completion. The research discovered that the problem force is mismatched content and extended course sequence. In a study conducted for the CAPR, researchers determined that the Dana Center Pathways Model (DCPM) could increase graduation rates. According to this pathway, there are three barriers. The first barrier suggests that students are placed in developmental courses but do not pass the classes. Scott-Clayton (2012) believes one in four students enrolled in a developmental math course could pass with a grade of B or better. The math pathways suggest using various measures for placement rather than using one test for placement. There may be students who remain underprepared, but a few studies show an increase in student academic performance after participating in the math pathways (Barnett et al., 2018; Couturier, 2012; Martinez, 2018).

The second barrier concerns the mathematical needs of the students. Students' mathematical needs and traditional entry-level math programs need an alignment for student success (Rutschow et al., 2019). Students were initially enrolled in algebra to begin their college careers. Through the study of four major mathematical organizations, students should be given a
choice of math pathways depending on their career path, including math computation, modeling, and statistics (Saxe & Braddy, 2015).

The third barrier concerns the long developmental math courses that may decrease students' chances to graduate (Jaggars et al., 2015). Students often fail to enroll in remediation courses, persist in their college career, or graduate when enrolled in a lower math class; therefore, the attrition rate increases. According to CAPR, two categories shorten the math sequence: co-requisite models for one-semester and one-year (Boatman, 2019; Logue et al., 2016). The Tennessee Board of Regents and City University of New York (CUNY) completed a study finding that students completed their co-requisite math course in less time. Many of these students in the developmental math classes will succeed but also need the support provided by the institution (McGuire, 2018).

Keeping in mind the low rates in which students in developmental education complete college, some institutions have required students to enroll in a lab. Creating a math sequence that relates to the student's career choice combines multiple alternate delivery models. Odessa College suggests using fewer instructor lectures and increasing computer-aided instruction (Epper & Baker, 2009; Saxon & Martirosyan, 2017). Computer-aided instruction helps students practice math problems with the instructor, in groups, or independently (Epper & Baker, 2009). Andragogy is an essential aspect of teaching math developmental education—designing the math class around adult learners' basic skills and how they participate in learning. The andragogical approach to teaching may play an essential part in math developmental education student success (Acosta et al., 2016; Rodrigues, 2012). In the andragogical approach, Wilson (2012) explains four learning environment characteristics that ease adjustment, struggle, and isolation. Wilson (2012) believes these four characteristics are present if adult learners positively engage in their instructional experiences: (a) relevant curriculum meets students’ personal or career goals; (b) an
experiential atmosphere is given, not just memorization; (c) accommodation in an educational environment is tailored to various backgrounds of students and their learning styles; (d) student evaluation of the instruction. As adult learners, students are encouraged to take the lead in their learning as the institution offers resources to support students in achieving their academic goals (Imel, 2002).

Throughout the years, developers and institutions examined Learning Assistance Centers (LACs) goals while developing placement criteria for students. Historically, education administrators created developmental education for privileged White males. LACs have grown to support first-generation, non-traditional males and females and economically disadvantaged students. Students of color and students who want to increase their academic skills are also considered developmental education clientele (Arendale, 2004; Wurtz, 2015). Institutions have provided support when students have enrolled in specific courses (Baier et al., 2019; Hughes & Scott-Clayton, 2011). Institutions can serve developmental education students better when understanding students' types, the students' needs, and students’ educational preferences (Kahu & Nelson, 2017).

Multiple literature sources support mandatory math testing and placement as an essential phase in the implementation of effective community college education programs (Boylan et al., 1995; Goldwasser et al., 2017; Park et al., 2016; Rhea & Cross, 1975; Rouche & Snow, 1977; Seifert, 2019). The Community College Research Center (2018) website showed students who take remedial courses at public two-year colleges represent 78% percent of Black students, 75% of Hispanic students, and 64% of White students. Seventy-six percent of the students who take remedial courses represent 27% of the lowest income group, compared to 59% of students in the most significant income category (Lewis, 2015). The efforts to ensure community college students complete college are to create succinct math course pathways to college completion.
Institutions also need to increase student support for academic success, creating pathways to graduation (Center for Community College Student Engagement, 2016; Levitz, 2015).

A considerable amount of documentation discusses learning centers outside of classroom instruction as essential to developmental education students' success (Blanck, & Martinis, 2015; Boylan, 2002; Casazza & Silverman, 1996; Maxwell, 1997; Scrivener et al., 2015). While many authorities (Boylan, 2002; Cho & Karp, 2013; Christ, 1971; Enright, 1975; Perin, 2004; Stern, 2001) identify the significance of learning centers in developmental education, research is absent regarding the full services provided by learning assistance centers and how students benefit from the services (Koricich & Boylan, 2019). Students’ success may require instructional assistance from tutors and various support entities (Wurtz, 2015). Developmental education classes, paired with LACs, help students achieve their academic goals (Boylan, 2002; Casazza & Silverman, 1996; Goldwasser et al., 2017).

Developmental education at two-year colleges has played an essential role in the success of students. It is common for students to enter college and take developmental education classes. Developmental education is available for students who may not have met the required admission and testing requirements. It allows students to enter college, but on a conditional status. Incidentally, it is sometimes necessary for students to have additional assistance while taking these classes. Institutional aid and involvement are the basis of providing students with additional support while taking developmental education classes.

**Institutional Assistance and Involvement**

Developmental education begins with the best practices implemented by the community college. Institutional assistance is crucial to students' developmental education (Bailey et al., 2016; Scrivener et al., 2015). Implementation of the best practices found in this research of institutional involvement and assistance will be most beneficial to the students and institution
Community colleges are building secure connections both within and outside the university that create educational “pathways” for students to progress over time to successful education and employment (Bailey et al., 2015; Holzer & Baum, 2017; Jenkins, 2002; Tomlinson, 1989). Structured educational pathways can help students decrease the time spent in college and increase the graduation rate. Each student has a pathway designed to meet their specific needs (Darling-Hammond et al., 2016; Karp, 2013). The best strategies for producing the institution's most desirable results are derived from relevant and successful teaching theories (Hamrick et al., 2002; Hollie, 2017; Soulé & Warrick, 2015). Learning assistance centers are among those services, particularly for the underprepared student who may not possess the skills needed to excel in class. Many scholars claim that developmental education is better for underprepared students and offers students an incentive to better their communities and their own lives (Bailey, 2018; Boylan, 1999; Franklin & Blankenberger, 2016; McCabe, 2000; McCabe & Day, 1998). Essentially, developmental education, coupled with learning academic centers, provides ultimate services for student success. Higher education institutions have developed their learning assistance centers for developmental education students to use for educational assistance. Learning assistance centers offer various services to include tutoring, computer-assisted instruction, evaluation, guidance, and counseling (Stern, 2001).

A study of 15 community colleges focused on understanding ways for LACs to help increase academic preparedness (Perin, 2004). Each community college offered some learning assistance centers with various services. This study mentioned Iowa State Community College, the Northwest Rural Community College, the Western Urban Community College, and the Western Suburban Community College learning centers. The learning center at Northwest Suburban Community College includes separate reading, writing, and math labs. The resources provided at this learning center included computer-assisted teaching, tutoring, writing, math
research skills classes, training groups, and specific test-taking skills (Perin, 2004). The Western Urban Community College has three LACs, including a content-area lab, reading lab, writing lab, critical thinking lab, and a math lab. The services include tutoring and self-paced math courses (Perin, 2004). The Western Suburban Community College’s learning center has a lab for nursing students. The learning center's services are abbreviated courses in academic skills, computer-assisted instruction, and math courses. Tutors are often used to support students in courses and facilitate further instruction (Perin, 2004). The emphasis on learning assistance centers and developmental education are closely related. The focus is to provide guidance and suggestions to increase college-readiness (Boylan, 2002; Casazza & Silverman, 1996; Hartman, 2018).

College readiness is also crucial in retaining students. Tinto (1999) provided a list of seven significant causes of student withdrawal. The seven critical reasons for student withdrawal are academic difficulty, adjustment difficulties, goals, commitments, finances, involvement, and learning (pp. 1-3). Students may not be able to learn the course content and may have issues with adjusting to college. Students also may not have set any initial goals and thus have no purpose or zeal for college. The student may have other commitments of higher importance. Tuition may be a financial burden on the student, prohibiting the student from enrolling in college. Tinto’s (1988) stages of departure suggested student withdrawal may lead to students transferring to other institutions or students departing from higher education permanently. An additional cause for students' concern is taking non-credited courses toward degrees (Twombly & Grubb, 2001). Roueche and Roueche reviewed 12 community college developmental education programs (1993, pp. 30-32). There were six policies concluded from this study as best practices for developmental education:

1. All entering freshmen should attend orientation.
2. There should be no late registration.
3. There should not be dual enrollment in basic skills (developmental) and college-level academic courses.
4. A reduction of the academic load for students who have jobs.
5. Remedial/developmental students should receive more financial aid opportunities.
6. Remedial/developmental courses should include problem-solving and literacy activities. (Roueche & Roueche, 1993, pp. 30-32)

Karp (2013) agreed, “When designing learning paths, colleges need to create some directed analysis of students’ early college encounters (p. 22). Karp (2013) also argued, “As transformation feedback and advice is given, colleges will be attentive to the ongoing interests of students to ensure that all students, not just new students, can participate in organized to directed academic and career preparation practices” (p. 24). Recent efforts by Jenkins et al. (2018) have also demonstrated the importance of institutions’ commitment to supporting community college student persistence. Tinto (2012) affirmed that institutional action plays an essential part in the success of students. Institutional response determines the various programs and activities on a college campus. Tinto (2012) believed in enhancing maintenance and graduation, and the organization must start by concentrating and setting up conditions inside the dividers that advance those results. Grady and Carter (2001) believed that numerous universities, notably two-year institutions, face requirements for giving instructional assistance to all students, especially for those people inside the area of developmental education. Students can attribute retention and certificate or degree completion to learning centers offering best practice interventions (Payne et al., 2017). Supplemental instructional support provides students with study strategies and additional enrichment to increase retention (Skoglund et al., 2018).
Institutional involvement is the bridge to successful students at two-year colleges. Institutions should provide resources and support for student success. Along with the resources and support institutions offer, faculty and staff are essential in implementing the institution’s initiatives. Elliott et al., (2015) and Sydow (2000) believed, “Effective professional development arranged by institutions uphold the professional vigor and efficiency of faculty leaders and other staff responsible for advancing student learning” (p. 384).

**Professional Development**

Colleges have placed a strong emphasis on the developmental education process through professional development. Accordingly, professional development is encouraged among instructors working with developmental education students. Developmental educators can enhance their skills through workshops, training, and other professional development (Boylan et al., 1999; Nielsen, 2018). Community colleges have worked to assist students in overcoming barriers to success in college and careers. Professional growth at an institution requiring tutoring, counseling, and training services resulted in higher student success levels and increased academic efficiency (Boylan et al., 1992; Nielsen, 2018). Community colleges can make available additional information to the remedial/developmental education program policies (Boatman & Long, 2018; Tomlinson, 1989). Tomlinson (1989) suggested that faculty who teach remedial/developmental education courses should collaborate with faculty teaching college-level courses.

One initiative to implement professional development in the community college is Pathways. Pathways provide long-term professional development (Bailey & Jaggars, 2016). The Carnegie Foundation for the Advancement of Teaching Community College Pathways takes credit for initiating a professional development program for community college professionals. Pathways systematically engage network consultants of institutional leaders, consultants, and
researchers to plan and implement an improvement effort that addresses students’ mathematical challenges (Acee et al., 2017; Edwards et al., 2015). Pathways is a professional development technique to help faculty teach a new developmental math—Statway or Quatway. The institution provides a support system as faculty are going through training. The training teaches faculty the latest methods of instruction for the first year. One conclusion from this study was that community college faculty professional development is designed with specific goals and desired outcomes, keeping in mind to encourage engagement (Edwards et al., 2015). Wynants & Dennis (2018) found that in institutions’ remedial programs that emphasize professional development, students will earn higher grades and demonstrate higher retention rates.

The Association of California Community College Administrators (2019) presented a program/seminar entitled Administration 201. The Administration 201 program is similar to Administration 101. This peer group in the Virginia Community College System (2017) used the Administration 101 program as a first response for professional administration development. Topics included in this professional development program are governance, instruction and student services, culture, human resources, finance, and community college (Chiriboga, 2003).

An inhibiting factor to significant professional development can be the process itself (Strickland-Davis et al., 2019; Zimmerman & May, 2003). Professional development committees and administrators devote much time and effort to creating a program that encompasses the myriad of topics discussed in the time frame set for professional development. Professional development programs for a common purpose, i.e., preserve the professional vigor and efficiency of faculty members and other experts who promote student learning (Sydow, 2000; Tumey, 2015).

The National Student Clearinghouse Research Center (2018) estimated in the fall of 2019, 5.4 million students will enroll in a public two-year college. According to the Community
College Research Center (2018), community colleges' enrollment rate is down 1.4% from the fall of 2018. As such, community college faculty and staff need adequate professional growth to further improve their awareness and expertise to better prepare students for the four-year institutions. The Joint Legislative Audit and Review Commission (2017) developed a list of various instructional support services, including writing and math centers, professional tutors, and peer tutors, to provide for developmental education students. Tutoring offers students opportunities to ask questions and to see the material presented differently. A paramount need for community colleges is to plan and execute an inclusive continuing professional development for their faculty and staff by advocating advisors' actions to determine the developmental students’ barriers to success (Epper & Baker, 2009; McCabe, 2000). Overall, effective professional development benefits employees of an institution, students, and the community (Battersby & Verdi, 2015; Boylan et al., 1992; Strickland-Davis et al., 2019). Significant professional development begins with the leadership of the community college institution.

Two-year institutions have developed “Grow Your Own” programs for preparing faculty to take on leadership roles because of the large number of faculty member turnovers within the system. Many of the institutions' faculty and leaders are aging and retiring (Reille & Kezar, 2010; Royer & Latz, 2016), which elicits the community college hiring process. The literature also emphasizes how workforce development in community colleges can provide competent faculty and staff professional development programs. Prospective leaders in the institutions will need training and leadership skills from those retiring from their current positions. There are leadership development programs for college leaders currently available (Wynants & Dennis, 2018; Reille & Kezar, 2010). Leadership development programs include graduate degrees and leadership programs. Many leadership professional development activities known as "grow-
"your-own" are customized by the college to suit employees' individual needs. (Morales, 2018; Neumann et al., 2018; Watts & Hammons, 2002).

Some studies have also examined community college’s creation of a resource database for newly hired faculty and staff to assist in the transition and adjustment. The resources idea database began with a cadre of students desiring to bring more reliable connections between classroom learning and community college (Chory & Offstein, 2018). Professional development topics for new faculty hired within community colleges will even need to be tailored to the professional development programs, types of students, and challenges indicative of a community college (Bailey et al., 2016).

The success of developmental education students relies on significant professional developmental efforts from community colleges (Diefenderfer, 2019). Staff training for learning assistance center staff is also necessary. Staff and faculty who work with developmental education students need the training to ensure the learning assistance centers can provide those extra educational and support services to developmental education students. Developmental education courses are beneficial to developmental education students. However, a learning assistance center with workers supporting developmental education students would improve developmental education students' progress.

**Tinto’s Theory**

Tinto (1975) identified three significant sources of student withdrawal from college courses in his theory. Tinto defines the three primary sources for student withdrawal as follows:

1. Students possess academic difficulties.
2. Students cannot determine or find a resolution to educational and occupational goals.
3. Students fail to become or remain connected to the academics and social life in college.
Student support helps students improve in any area of concern through one-on-one advising, counseling, and tutoring (Fowler & Boylan, 2010; Horde, 2017). Tinto also stressed persistence in his model. Persistence occurs when a student successfully takes an active part in education—academically and socially. Tinto (2005) also emphasized the need for researchers to focus on low-income students. There is a need for research efforts in developmental education because of the connection between low-income students and being academically underprepared.

For many years, colleges and universities have offered pre-college level courses designed to teach the necessary academic skills required for college (Xu & Dadgar, 2018). Higher education was influential in the early twentieth century and was an influence on society. Community college development was a response to ensure the preparation for society to work. Cohen and Brawer (1989) stated that training of the new technologies administered by the community would increase the workforce in communities.

During the 1960s, the community college system initiated an “open door” policy. Due to the low cost of education within the community college system, students from various backgrounds could attend community colleges with a successful end in mind. While community colleges enroll students from multiple backgrounds, students are guided in this process and are successful contingent upon their goals (Cohen & Brawer, 1989; Juszkiewicz, 2017; Ma & Baum, 2016). Community colleges also had low tuition and were in the local community. Community colleges provided students with various courses and various ways to access these courses (Boatman & Long, 2018; Dougherty et al., 2017). Various institutions handle the distribution of developmental courses differently (Bailey & Jaggars, 2016; McFarland et al., 2017). However, many institutions do not require students with low skills to enroll in developmental education. The “open door” policy gave students a road to success. Bragg et al. (2006) encouraged colleges to provide various entry points for minority, low-income, and underprepared students, especially
first-generation students. Although community college enrollment is now more accessible, many students who attend community colleges do not acquire a degree or certificate (Berkner et al., 2000; Xu & Dadgar, 2018).

Tinto’s (1975) model has been useful in developing ways to assist with retention. Community college students have difficulties maintaining enrollment in school due to background characteristics, possibly preventing students from achieving their goals. Student’s circumstances may prevent them from completing college. The circumstances may include their age, socioeconomic status, personality, and any experiences students have had before college (Kuh et al., 2006).

Students who have two or more developmental education courses are least likely to succeed at the two-year institutions (Bailey et al., 2010; Terriquez, 2015). Forty-one percent of students who begin college are not ready for college-level work, resulting in discouragement, delay, and dropouts (King et al., 2017). The attrition rate of our developmental education students is declining. A national study of community college education reported 41% of community college and 29% of all four-year college or university students enrolled in college underprepared, lacking the necessary reading, writing, and math skills (Park et al., 2018). The National Education Longitudinal Study (NELS) sample results indicate more than 75% of the developmental education students enrolled in community college will complete a degree or certificate within eight years of college enrollment. Before transferring to a four-year institution, 29% of community college graduates received a vocational credential or associate degree (Jenkins & Fink, 2016). Many of the students in developmental education courses are either failing or withdrawing from classes. Tinto (2006) discussed retention in institutions to directly reflect students’ academic skill levels, attributes, and motivation. Students who did not remain in college are considered less motivated and unable to complete college.
Student success relies heavily on institutions planning and implementing the needs of developmental students. Ormsby and Morrow (2019) maintained that institutions must examine incoming developmental education students' data and trends to develop a curriculum that will use effective and best practices. Tinto’s (1988) model of student withdrawal offered a more precise explanation and clarification of why students quit college. Tinto’s model also examined how an individual’s prior experiences and connections influence an individual’s opportunities during and after college. Tinto (1999) offered several action plan principles for the implementation of a retention program:

1. Provisions for the institution should include resources for incentives and professional development, including faculty and staff.
2. Commitment from the institution should consist of strategic program development.
3. Institutional change should be implemented campus-wide.
4. Collaborative institutional actions should ensure a well-organized and a campus-wide approach to student retention.
5. Professional development should be provided for faculty and staff to acquire the skills to teach their students.
6. Retention should be the institution’s goal.
7. A periodic assessment of the program should be essential.

Tinto’s (1988) model of departure identified educational issues and recognizes why students fail to be involved in campus activities and other intellectual events. Precisely, he speculated three reasons for student departure: separation, the transition to college, and incorporation in college (p. 441). Tinto’s model (1975) also included the conditions of expectation, advice, support, involvement, and learning within the institution, which helps increase the retention rate. Tinto’s (1988) model of student departure also emphasized how
students may enter college with different backgrounds and experiences. These experiences may include different family backgrounds, socioeconomic status differences, academic readiness, lack of dedication, and specialized knowledge as additional characteristics indicate students’ departures from colleges.

Van Gennep et al. (1961) believed the individual experiences in the Rites of Passage within society keeps the student stable in times of change. Van Gennep et al. (1961) described the rites of membership in society as The Rites of Passage. The stages in The Rites of Passage, as defined by Van Gennep et al. (1961), are separation, transition, and incorporation. Tinto (1988) reported that students might experience The Rites of Passage while enrolled in college. Separation is defined as a decrease in socializing with a group in which the individual has become familiar. The second phase, transition, is when the individual seeks membership in a new category by networking with members of that group. The third phase, incorporation, involves adapting to the new group's culture and acquiring its characteristics as a full member (Silber, 2018).

Tinto (1988) believed undergraduate students move from one group or set of units (most generally those of the secondary school and the family) to another group. Tinto thought students should remove themselves from past relationships, which may prohibit the attainment of goals. In endeavoring to achieve such goals, students will experience troubles and personal challenges as college students. Tinto (1999) claimed students must first remove themselves from the group of which the student had previous associations. This association could be with family members and high school peers. The student then goes through a period of transition. Tinto also believed the individual starts to communicate in new routes with the individuals from the latest gathering and incorporate or adopt new values and behaviors of the original group or college (Tinto, 2006).
**Student Departure**

An instructional organization's focus comes from observing the number of students who leave college and do not return, is known as student departure (Tinto, 1975). Student departure plays a significant role in the community’s perception of the institution in the local community. Correspondingly, the institution may devise a plan for retaining students. An increase in retention rates will occur when institutions investigate methods to enhance developmental education. Also, institutions may focus on promoting and adopting policies to increase retention and reduce student departure. This approach is the integrated design approach to help improve student retention. Braxton et al. (2004) have reported in a mixed design approach.

2. The president and chief academic affairs officer and other members of the administration, faculty, and staff of the institution emphasize the importance of commitment and support institutional policies and practices.
3. In some instances, student departure may be the best solution for the student and the institution.
4. The institution will develop policies and procedures to help prevent student departure.
5. This approach helps increase the retention rates in that institutions will recognize the importance of assessing policies and practices' effectiveness.

The institutional approaches examined by Tinto (1975) and Braxton et al. (2004) revealed the need for institutions to establish programs to provide students with instructional support. Institutional policymakers are essential in indirect actions to increase retention and student persistence. A combined effort of various departments and decision-makers of an institution is needed to make the necessary student success changes. Wilmer (2008) suggested a centralized organizational structure (Boylan, 1999; Horde, 2017; Roueche & Roueche, 1999; Taylor &
Lepper, 2018) within the community college in ensuring the success of the students. The organizational structure encompasses a director who is knowledgeable of the needs of developmental education students. The development and implementation of learning assistance centers will provide students with an avenue toward success in their classes. Researchers are making efforts to create methods for evaluating the effectiveness of these programs. A continued effort may focus on how these programs’ success may have a possible connection to students' success (Tinto, 2006).

**Description of Program or Policy Context for Evaluation**

Learning Assistance Centers (LACs) have had many names for the service centers over the past 40 years (Arendale, 2002; Giraldo-García & Magiste, 2018). While Learning Assistance Center is a term used in professional literature, academic learning centers may have various program names on campuses. Nationally, there are over 160 names for Learning Academic Centers (Arendale, 2010; Franklin & Blankenberger, 2016). The following are some examples: Academic Success Center, The Academic Advancement Center, Bureau of Study Counsel, and The Student Learning Center (Christ, 1971). Each campus will have a name for each learning center, depending on the preference of the campus administration, faculty, and staff (Arendale, 2004).

An additional name for the service centers is Learning Assistance Programs (LAP). Learning Assistance Programs accommodate students’ learning styles, learning goals, and learning development through individualized tutoring, mentoring career instruction, and counseling. The primary purpose of LAPs is to include learning resources for students to develop their capacity to learn and attain academic achievement. A study for the Council for the Advancement of Standards (CAS) in Higher Education by Agee et al. (2018) suggests LAPs must create, distribute, implement, and review their goals and missions. The purposes and tasks
will be compatible with the organization's intent and with the relevant ethical principles. Agee et al. (2018) suggested all learning/academic centers share almost the same characteristics and approaches.

The goal of any LAC is to help students be successful during their college careers. Christ (1971), an early researcher of LACs, stated, “A (LAC) is a facility where students (learners) go to improve their skills and attitudes, especially in the areas of reading, writing, computer, and learning skills” (p. 39). The integration of instructional support services with coursework will help students achieve. The introduction of instructional support and other student services would create a method encompassing all students' needs in remedial education. Remedial education is identified as developmental education (Roueche & Roueche, 1999).

The study’s rural community college located in Alabama’s southeastern region, is an Associates of Arts College with the Carnegie Classification as a two-year institution. The college was one of the thirteen two-year colleges established in the southeastern region of the United States due to the Alabama Junior College and Trade School Authority Act of 1963. The college currently has 15 campuses and 100 and 26 faculty members due to a merger of three community colleges in 2016. The merger has allowed the college to offer 100 programs of study to the more than 10,000 students enrolled at the community college. The location of the administrative building and FAME Lab is on the main campus. The math department governs the FAME Lab, which has an interim director. The interim director monitors and creates the tutor schedule for the FAME Lab.

A learning assistance center – the FAME Lab – at a rural community college located in Alabama's southeastern region is available as needed for tutoring, mentoring, and academic support. The FAME Lab provides developmental education students with an educational foundation required to be successful. LACs offer students a means to get the extra assistance.
LACs provide one-on-one tutoring by building relationships students need for success. Students who take developmental education courses will benefit most from services such as advising, counseling, and tutoring, but the institution needs to promote these services (Boylan, 2002) actively.

Developmental education may act as a cover for maintaining several innovative approaches intended to develop students’ varied talents (Hagedorn & Kuznetsova, 2016; Rhea & Cross, 1975). Early studies suggested successful programs were essential for student success (Boatman & Long, 2018; Roueche & Snow, 1977). Also, Miranda (2014) summarized studies to illustrate institutions making an effort to assist students with low or weak academic skills, yet emphasizing there may not be adequate assistance to help students succeed.

Throughout the years, LACs have evolved to meet the needs of their students. The purpose and task of the LACs are to benefit students in need of academic support. Developmental education, combined with the LACs services, provides an increased chance for developmental education students to succeed. Although learning assistance centers are available for academic support, students need assistance in other areas to decrease the likelihood of departure. Tinto (1975) addressed the various needs of students in college, which should be satisfied. Institutions can carefully plan through the learning assistance centers the best course of action for each student’s success.

The FAME Lab

The FAME Lab was created to meet the needs of students who need additional mathematics academic support. Faulkner State Community College QEP’s main focus was establishing a learning assistance center to meet the students’ educational needs. The Learning Assistance Center at a rural community college located in Alabama’s southeastern region, the FAME Lab Institute, is available as needed for tutoring, mentoring, and academic support.
Faulkner State Community College created the QEP for the enhancement of student learning by creating an advanced program to support and provide assessment strategies to students in the high-risk courses of Elementary Algebra (MTH098), Intermediate College Algebra (MTH100), and Pre-Calculus Algebra (MTH112). The QEP team was composed of the community college’s deans, faculty, and staff. The QEP team members were then divided into several subcommittees. The mathematics department was one of the subcommittees. After discussion, there were five areas of focus for the QEP: (a) student engagement, (b) advising, (c) professional development, (d) learning styles, and (e) developmental studies. The QEP committee decided on the topic of The Faulkner Academy of Mathematics for Excellence. The FAME Lab’s focus is on improving student learning outcomes and achievement for students taking Elementary Algebra (MTH098), Intermediate Algebra (MTH100), and Pre-Calculus Algebra (MTH112).

The Elementary Algebra (MTH098) course is a review of essential mathematics and algebraic operations. This course's concepts include the numbers of simple arithmetic and its properties, integers, and rational numbers; the resolution of equations, polynomials, factoring; and an introduction to equation and graph structures. The Intermediate Algebra (MTH100) course presents an overview of algebraic methods such as linear equations and inequalities, quadratic equations, equation structures, and exponent and radical operations. Functions and relations are introduced and graphed with particular emphasis on linear and quadratic functions. This course does not apply to the general core requirement for mathematics. The Pre-Calculus (MTH112) course examines function algebra, including polynomial, rational, exponential, and logarithmic functions. Also, this course covers equation and inequality structures, quadratic inequalities, and the binomial theorem. Matrices, Cramer's Rule, and mathematical induction can be additional subjects. The researcher selected these courses based on low achievement rates, high failure rates, placement difficulties, and course necessity.
The FAME Laboratory accommodates students with computers installed with assistive software and tutors. Boylan and Bonham (2014) also emphasized active learner techniques, which are also considered learner-centered activities integral to student success levels. Students actively participate in these activities in the LACs, which leads to success for students. The active learning technique is a concept coined by Freire (2005). Freire (2005) also believed in teaching the child by building on his experiences or prior knowledge; teaching is not a process of transference of knowledge from teaching to the learner. Freire (2005) stated, “Teaching is the mechanical transference from which results in machine-like memorization” (p. 22). Freire (2005) also believed that students learn more when actively engaged with their studies than as passive learners. In active-learning, students do not sit through lectures but instead, take actions and explore knowledge for themselves. In the FAME Lab, students are encouraged to be active participants in their learning. Students should not become robots in education but become active participants in the classroom, being a part of the instruction (Dewey, 1923). Dewey (1923) believed that a democratic teaching method would provide freedom to the students and teachers within the environment.

Research has shown learning assistance centers eliminate barriers to learning for developmental education students through support services (Gibbs, 1994; Wurtz, 2015). The tutors allow for learning experiences to occur in FAME Lab so the student can reach the highest potential (Wilmer, 2008). Boylan (2002) posited best practices as the institution participating as a whole organization, including administration, instructional staff, counselors, advisors, and tutoring. The literature and research in developmental education validate these practices (Boylan, 2002; Wurtz, 2015). Christ (1971) also defined best practices as foundations and activities the institution perceives as compatible with its mission and the affiliated mission of its academic
support center, also known as the learning support center. Christ (1971) also agreed, Learning Assistance Centers provide:

1. educational assistance.
2. referral agency for medical, psychological, financial, and spiritual aid.
3. academic and study skills resources.
4. tutors, peer counselors, and paraprofessionals training.
5. faculty with updated information on current research and best practices.

Learning assistance centers are places of learning support for developmental education students. The FAME Lab, located at a rural community college in Alabama’s southeastern region, provides these services. Trained tutors provide support and academic assistance to developmental education students. The opinions of the developmental education students who use learning assistance centers can help the FAME Lab team improve. Learning assistance centers or learning centers provide instructional support. These centers provide students with study strategies and supplemental enrichment to help increase retention. Learning assistance centers offer a way for students to get extra assistance. In a study by Payne et al. (2017), students’ readiness is difficult to assess. Additionally, the diversity of students who enroll in college is reflected in enrollment in developmental education courses. The centers also provide one-on-one support for students to build those relationships needed for success.

The study's setting is the FAME Lab at a rural community college located in Alabama's southeastern region. The FAME Lab offers students additional assistance to seek individual and scholarly advancement. The FAME Lab provides an area to unite an assortment of services, learning hardware, and educational programs for students (Arendale, 2002b; Hart, 2017). The key players of the FAME Lab are the tutors. Classroom instructors are also involved in the process through collaboration with the tutors in the FAME Lab. Christ (1971) stated, “The LAC
is a site developed with a learning environment, working principally to empower students, offering instructional exercise, and assists in the referrals to others helping students” (p. 35). There are three components of the FAME Lab services: tutoring for all students; encouraging interaction between students, faculty, staff, and tutors; and easing the mathematical learning process. The prevalence of services provided to developmental education students includes academic advising, tutoring, and a range of other services (Bader & Hardin, 2002; Boylan & Bonham, 2014; Pugatch & Wilson, 2018; Widmar, 1994). The LAC is developed for students to obtain assistance in bridging from developmental courses to academic courses. Instructors play a significant role in assisting students to achieve academic success. Expert instructors' interventions are typically extensive, combining instructional exercises with demonstrating, encouraging, and guiding practices to help students create a successful path (Boylan, 1999; Kim, 2015). One study discovered remedial courses’ effectiveness when regular efforts could balance exiting remediation standards and enter curriculum courses (Boylan et al., 1992). Institutions are offering support as students are bridged to the standard courses that result in student success (Boatman & Long, 2018; Boylan & Bonham, 2014). Therefore, developmental education faculty help preserve the academic standards (Arendale, 2002; Boylan & Trawick, 2015; Christ, 1971; Hassel, 1999; Stahl, 2000).

Boatman and Long (2018) noticed that students had higher pass levels in remedial courses when incorporating remedial classes into the institution's academic norm. Organizations with remediation programs have proven to produce graduates than organizations lacking comprehensive remediation programs. Chickering and Gamson (1989) suggested improving education in the classroom meets these seven standards in good practice.

1. Students and faculty should be encouraged to make constant contact, which fosters student persistence.
2. Students should be active participants in their classes to retain information.
3. Students should be encouraged to collaborate and network.
4. The faculty should give immediate feedback to students.
5. Students should work on time management skills and use time wisely.
6. The institution should expect high expectations of the students.
7. The institution should respect the diverse ways students learn.

The purpose of this program evaluation was to explore relationships of the FAME Lab characteristics and specific perceptions of students enrolled in developmental math education courses in a rural community college located in Alabama's southeastern region. Analysis has shown that combining such programs with developmental classes can help students reach university-preparedness. Other educational resources will establish a holistic solution to remedial education, known as developmental education (Boylan & Trawick, 2015; Roueche & Roueche, 1999).

The researcher applied the responsive evaluation to this research because it helped the researcher obtain a prompt understanding of the FAME Lab and which issues and concerns are most critical. The responsive evaluation also uses content-rich data to describe the FAME Lab in a way available to audiences. There was not an evaluation component of the Fame Lab before the research.

Chapter Summary

Chapter 2 provided an in-depth examination of the responsive evaluation model and related literature surrounding the study focused on analyzing the influence of a learning assistance center on the success of developmental education students at a rural community college in the southeastern region of Alabama. As outlined by Stake (1976), the responsive evaluation approach is described in detail in the chapter and guided the current study's
evaluation. The researcher integrated the case study with Stake’s (1976) RE model based on the study's theoretical perspective. A description of the learning assistance center or program (FAME Lab) is given within the purpose and service-specific details of the responsive evaluation approach. The information provided in this literature review suggests colleges need to provide students with support services for tutoring, mentoring, and advising. The literature supports the proposed study in several ways: (a) the literature review historically documented learning assistant centers as helpful for underprepared students; (b) the literature examined in Chapter 2 addressed the necessity for developmental education classes and support for developmental education students; (c) previous research efforts described in Chapter 2 provide a minimal amount of information concerning the need for a focus on curriculum development in the process of developing learning assistance centers. The existing literature review highlights the need for current research efforts to examine the role and influence of curriculum development as an essential element in creating an effective assistive or success center for students. The study incorporated the findings of this literature review to establish the research question and the study design, as evidenced in Chapter 3.
Chapter 3: Evaluation Design and Methodology

This chapter provides an overview of the evaluation design and methodology and examines the following areas of information: (a) the focus and scope of the evaluation, including the limitations and delimitations of the study; (b) the responsive evaluation plan and data collection procedures; (c) a description of the site selection/setting of the research; (d) the description of the study participants, data sets, and program agency; (e) a discussion of the ethical issues and considerations associated with the study; (f) a description of the Institutional Review Board (IRB) considerations and procedures; and (g) a discussion of the researcher positionality. The chapter concludes with a chapter summary.

The research applied Stake’s RE to this study. Responsive evaluation is a process in which a researcher measures the effectiveness of an educational program. Stake’s responsive evaluation uses a step-by-step measures evaluation. The program evaluation is concerned with the needs of the participants. The purpose of this program evaluation was to explore relationships of the FAME Lab characteristics and specific perceptions of students enrolled in developmental math education courses in a rural community college located in Alabama's southeastern region. The researcher utilized one central research question and three specific evaluation questions as the framework of responsive evaluation. The researcher posed the following central research question: What are the perceptions of students about the FAME Laboratory program in meeting the needs of underprepared students enrolled in community colleges? In addition to the central research question, the study examined three specific research evaluation questions or research questions:

**RQ1:** What influence does the FAME Lab tutoring program have on the self-perceived academic performance of developmental education students?
**RQ2:** What are the perceived factors influencing developmental education students’ access and use of the FAME Lab?

**RQ3:** How do students perceive the value of the FAME Lab relative to developmental classes?

**Focus and Scope of the Evaluation**

The evaluation study's focus and scope include the examination of the delimitations and limitations of the study. The delimitations and limitations highlight the study's reach and articulate the study's boundaries and potential weaknesses.

**Delimitations**

Delimitation is a specific boundary assessed relative to the natural occurrence of events during the study's implementation and is within the researcher's control (Theofanidis & Fountouki, 2018). Simon and Goes (2013) believed that delimitations are specific choices made by the researcher. The study examined the success rate for freshman students enrolled in developmental education courses in a rural community college located in Alabama's southeastern region on one campus. The study restricted the inquiry to include full-time and part-time community college students attending college in the day or evening. The researcher also sought study participants from one institution because the responsive evaluation process's specific nature focuses on a specified entity rather than a general population of institutions/students. The researcher limited the research inquiry to students’ perceptions of the FAME Lab, accessing only students who attended a rural community college in Alabama’s southeastern region.

Creswell and Creswell (2017) noted that delimitations help further define the research study's parameters. The researcher limited the investigation to a rural community college in Alabama’s southeastern region to adequately accommodate the research question specifications. Students’ perceptions of a specific learning assistance center – the FAME Lab – defined the
study's parameters and may limit study findings or the study implementation's potential scope. Another delimitation involved the study's timeframe, especially examining the FAME Lab users during one specified semester. The research focused on students' perceptions at a rural community college in Alabama’s southeastern region. Implications of the study's findings are relevant only to the evaluation's scope described in this section. Specific consideration of the limitations and delimitations as potential influences on the study's outcomes is inherent in the responsive evaluation design.

**Limitations**

This research study included several limitations. Limitations are weaknesses or items that arise in the study, which are out of the researcher's control (Creswell & Creswell, 2017). Limitations of this study's chosen research approach include access to the student participants, the type of student participants, researcher bias, and site selection.

Participants were not able to meet for face-to-face interviews. The researcher used other means to gather the data from the participants. As such, the researcher provided a questionnaire for the participants to complete. Interpretation of the study's findings is limited to only those perceptions, information, and communications retrieved from these specified stakeholders' participation. Specifically, the research focuses on studying developmental education students enrolled in a rural community college in Alabama’s southeastern region. Study participants were students who were currently or had previously enrolled in one or more developmental education courses. After identifying this pool of students for participation, 23 students from this group participated in the study. The selected participants provided supportive information useful for the representation of the developmental education students at the institution. Adult education and dual enrollment students are not included in the study.
An additional potential limitation in this study is the researcher's bias. Even so, the researcher attempts to minimize bias and maintain objectivity within all research protocols. The researcher previously worked as a librarian for a community college; however, the researcher does not currently work for the community college included in this study. The researcher was an instructor for basic study skills and developmental reading classes. An additional limitation of the study is the examination and presentation of findings by the nature of the researcher’s abilities and skills to perform the analysis. The researcher accessed the FAME Lab at the community college used for the study. The study of only one community college may affect the research and merely reflect one community college's perceptions. The identified limitations presented could establish a need for future studies. The influences are beyond the researcher's control (Stake, 2004; Theofanidis & Fountouki, 2018).

The study mainly examined developmental education students enrolled at a rural community college in Alabama’s southeastern region. Students’ specific regional or inherent characteristics and unique institutional factors may have influenced study outcomes. Specific activities occurring during the single semester of the data collection may not be representative of all semesters. The activities may not typify the types of students utilizing the FAME Lab regularly each semester. College achievement and retention are progressive concepts requiring ongoing monitoring and assessment. The researcher attempted to minimize prejudice and preserve impartiality when performing specific analysis methods. If it were not so, the researcher could influence the study procedures' accuracy (Hancock & Algozzine, 2017).

**Evaluation Plan and Data Collection Procedures**

This section provides a detailed discussion of the study's framework and research design and emphasizes the evaluation study's major research question. The discussion in this chapter describes data collection procedures and the action plan's alignment to the framework.
Information in this chapter focuses on the framework’s structural components, and the evaluation question propelling the study is included in the discussion.

**Design**

The nature of the analysis is a case study with a primary collection of data performed using a questionnaire instrument. This case study research design (Creswell, 2017) utilizes Stake’s (1976) RE framework as the underlying approach for generating the plan of action for the current study. Stake’s (1976) RE framework provided the structure for determining the research’s timeframe and the action plan for establishing the procedures appropriate to evaluate the data gathered during the study. According to Stake (1976), the evaluator enters the setting and imbeds an evaluator’s perspective into the program’s continuity and operations (Paolucci-Whitcomb et al., 1987). The method for selecting student participants was that of purposeful sampling. The researcher considered math developmental education students for the study.

Responsive evaluation is an approach designed to meet the needs of program participants and others affected by the evaluation. Stake (1976) recommended that the researcher use responsive evaluation to be involved and interactive by communicating with the primary stakeholders. The analyst is often interested in exploring events taking place on-site through practical methods, including stakeholders. Many evaluation plans are more pre-ordinate than responsive evaluation and emphasize (a) goals, (b) application of objective tests, (c) ideals held by program personnel, and (d) research-type reports. Responsive evaluation depends more on natural communication than formal communication (Stake, 2014).

The study utilized a responsive evaluation design (Stake, 1976) for examining perceptions of students within a community college developmental education program relative to three areas of focus: (a) students’ expressed access and use of the FAME Lab services; (b) students’ perceptions of the influence of the FAME Lab services relative to academic
performance levels; and (c) students’ perceived value of the FAME Lab comparative to successes in developmental math courses.

For this study, the research design (Creswell, 2017) advanced in the following steps: (a) constructing and deciding the methods of addressing the issue by assembling a collection of research questions, (b) evaluating the associated literature; (c) identifying research methods and procedures for collecting data from research participants, and (d) explaining research methods and practices for collecting data. The researcher continued scientific advancement by (a) determining a test design; (b) selecting the sample for the study; (c) planning a sampling procedure, and (d) creating strategies to secure samples. The next stage the researcher completed was collecting the data, preparing the data for analysis, analyzing the data and interpreting the results, and communicating and utilizing the findings in practice. According to Stake (2004), there are prominent events which occur during the research evaluation. The events on the clock (Figure 1) do not have to occur in the order provided on the clock. The events may appear more than once or even at the same time. Applying Stake’s clock model evaluation method requires the researcher to consider each part of the clock while evaluating events. According to the clock of prominent events, the researcher collects data after choosing the instrument and observers. The researcher gathered data through a questionnaire, observations, and artifacts.
Adaptation of Stake’s (1976) Responsive Evaluation of Prominent Events

<table>
<thead>
<tr>
<th>Time</th>
<th>Stake’s Description</th>
<th>Time</th>
<th>Stake’s Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:00</td>
<td>Have a dialogue with clientele, staff, audiences</td>
<td>6:00</td>
<td>Choose observers, judges, instruments, if any</td>
</tr>
<tr>
<td>1:00</td>
<td>Recognize the scope of the program</td>
<td>7:00</td>
<td>Observe designated qualifications, connections and outcomes</td>
</tr>
<tr>
<td>2:00</td>
<td>Summary activities of the program</td>
<td>8:00</td>
<td>Create the idea; prepare depictions, case studies</td>
</tr>
<tr>
<td>3:00</td>
<td>Determine purposes and concerns</td>
<td>9:00</td>
<td>Confirm or attempt to disconfirm</td>
</tr>
<tr>
<td>4:00</td>
<td>Theorize issues and problems</td>
<td>10:00</td>
<td>Examine and organize for audience use</td>
</tr>
<tr>
<td>5:00</td>
<td>Recognize data essentials, concerns</td>
<td>11:00</td>
<td>Create official reports if any</td>
</tr>
</tbody>
</table>


Responsive evaluation is a process in which a researcher measures the effectiveness of an educational program. Stake’s RE uses step by step measures in the evaluation process. The program evaluation is concerned with the needs of the participants. The purpose of this program evaluation was to explore relationships of the FAME Lab characteristics and specific perceptions of students enrolled in developmental math education courses at a rural community college in Alabama’s southeastern region. The researcher utilized one central research question and three specific evaluation questions in the framework of responsive evaluation. The following was the central research question: What are the community college’s stakeholders’ perceptions about the FAME Laboratory program in meeting the needs of underprepared students enrolled in community colleges? The following were the specific research evaluation questions:
RQ1: What influence does the FAME Lab tutoring program have on the self-perceived academic performance of developmental education students?

RQ2: What are the perceived factors influencing developmental education students’ access and use of the FAME Lab?

RQ3: How do students perceive the value of the FAME Lab relative to developmental classes?

Data Collection Procedures

The responsive evaluation clock of prominent events aided the researcher in gathering data for the areas of focus. Stake (1976) provided the clock of prominent events for researchers to use when evaluating a program. The researcher applied the clock of prominent events strategies in the collection of data. The researcher chose the area of focus as mentioned in Chapters 1 and 2 because of (a) the interest in the success of developmental education students; (b) the interest in learning assistance centers; and (c) the interest in community colleges.

Creswell and Creswell (2017) discussed the process of obtaining approval from review boards. The researcher began the research by contacting the Institutional Review Board. Initially, the researcher investigated the process of obtaining permission from the IRB. The researcher communicated in detail the description of the research, operation of the study, identification of the participants, the length of time to conduct the research, and how the results are handled. The researcher sought approval from the site to conduct the study. The researcher contacted a gatekeeper to gain access to the research site. According to Creswell and Creswell (2017), some required information to be given to the gatekeeper might include the following: why the site was chosen for the study, accomplishments during the study, how much time will be spent at the site, what potential is there for disruptions, how the report will be used, and what the individuals will gain from the study (Creswell, 1998). Detailed information about the research was submitted to
the Vice-President of Instruction for approval. Such approval is one solution to discussing research-related ethical issues. The researcher provides specifics since the approach to education analysis might not be familiar to the IRB. The researcher may conduct the study in homes, workplaces, or sites of the study participants (Creswell & Creswell, 2017). The researcher collected data by starting with the 12 o’clock time on the clock of prominent events and progressed through each time on the clock.

Twelve o’clock- The evaluator has a dialogue with clientele, staff, audiences. The researcher began the data collection process by communicating with the Vice-President of Instruction, seeking permission to complete a study on the campus. The researcher also gathered data by having informal conversations with the FAME Lab interim director and a math instructor. The math instructor (co-investigator) was assigned to the researcher to assist with the study. The researcher met with the co-investigator. The co-investigator is a math instructor at the community college and oversees the FAME Lab's functions. The researcher and co-investigator established a plan to gather data through observations, face-to-face interviews, and the collection of artifacts. The co-investigator shared the FAME Lab’s mission, schedule, lab tutors list, and the Faulkner State Community College Quality Enhancement Plan (2006) with the researcher. The researcher reviewed documents from the state department of education, state community college, and the institution for evidence.

One o’clock-Two o’clock- The evaluator recognizes the program's scope and summarizes the program's activities. These conversations led to the researcher investigating the FAME Lab's scope and researching the activities of the FAME Lab. The researcher began requesting information and documents about the FAME Lab. The math instructor (co-investigator) provided the Faulkner State Community College QEP (2006), which discussed the FAME Lab’s purpose, activities, goals, and mission. The researcher gathered additional data by observing the FAME
Lab. There were three observations of the FAME Lab, which lasted an hour each. The observations were conducted between November and December.

Three o’clock- The evaluator determines purposes and concerns. The researcher recognized from the literature the need for additional research on the perspectives of developmental math education students who use learning assistance centers.

Four o’clock and Five o’clock- The evaluator theorizes the issues and problems. The evaluator also recognizes data essentials and concerns. The researcher created three research questions and fifteen questionnaire questions for the study. The researcher received advisement from the Dean of Enrollment Management/Dean of Students of the community college on the questions’ formatting. The researcher then chose student participants through purposeful sampling. According to Creswell (2017), purposeful sampling is utilized when the researcher selects individuals and sites for a study to help the researcher best understand the research problem and questions. Student participants were selected from students who had taken a math developmental education course at the community college on the main campus. The researcher received twenty-three responses to the questionnaire. The questionnaire was available for the students to access from November 2, 2018 to December 11, 2018. The researcher gathered data through observations, a questionnaire, and a collection of artifacts. These artifacts utilized in the study were a variety of documents relating to the FAME Lab. The institution and the State Department of Education (State Community College) documents are categorized below.

Institutional Documents include:

- FAME Lab mission
- FAME Lab schedules
- QEP (Quality Enhancement Plan) Document 2006
- Math Instructors names
State Department of Education Documents include:

- Math 080, 090, 091, 092, 098 099 Course Description: College Preparatory/Developmental Studies
- ACCUPLACER® Program Manual

Six o’clock - The evaluator chooses observers, judges, and resources (if any). The researcher selected to use a questionnaire as the instrument to gather data. The researcher then chose student participants through purposeful sampling. A co-investigator (math instructor) also assisted in the research. The co-investigator helped send the student participants a link to the questionnaire in Google Forms® through their school email and electronically signed the form as approval for participating in the research. The researcher allowed two weeks for the student participants to complete the questionnaire. The researcher recorded the student participants’ responses and disaggregated the data in Google Sheets®. The community college preferred an employee of the community college to communicate with the students because of the Family Educational Rights and Privacy Act (FERPA) Law. FERPA Law (Feder, 2013) protects the privacy of students’ educational records. The community college would only allow an employee of the college to access student information, such as email addresses. The co-investigator also served as the gatekeeper and assisted the researcher during the research. The FAME Lab interim director and co-investigator provided information to the researcher in the form of informal discussions and the QEP document.

Seven o’clock - The evaluator observes designated qualifications, connections, and outcomes. The FAME Lab was created to improve student competencies in high-risk mathematics courses Elementary Algebra (MTH098), Intermediate Algebra (MTH100), and Pre-Calculus Algebra (MTH112). The researcher made observations at the FAME Lab. The researcher observed the activities at the FAME Lab on three days. The researcher observed the
FAME Lab on November 12, November 16, and December 4. The FAME Lab students were working on assignments, conversing with other students, and completing their work. The questionnaire provided results addressing the perspectives of the students who used the FAME Lab.

Eight o’clock- The evaluator creates the idea, prepares depictions and case studies. The researcher described each student who visited the FAME Lab during the observations. The questionnaire provided questions about the demographics of each participant. Responsive evaluation was conducted in this case study to understand the complexity of the FAME Lab activities (Stake, 2004).

Nine o’clock- The evaluator validates, confirms, and assembles reports. The researcher gathered the data through observations, questionnaires, and documentation. The researcher created charts and graphs from Google Sheets® after the collection of data.

Ten o’clock- The evaluator examines the gathered information from observations, questionnaires, and artifacts. The researcher examined the data and provided a written report for the research. The data was then reviewed and prepared for the report. The artifacts include the QEP (2006), and documents from the FAME Lab, the community college, and the State Community College System. The college’s QEP had the FAME Lab’s missions and goals, FAME Lab planning, FAME Lab participation timeline, FAME Lab configuration, and the FAME Lab’s proposed implementation. The Faulkner State Community College QEP (2006) also provided the design and timeline for implementing the FAME Lab. The FAME Lab documentation included the FAME Lab mission and tutoring schedules. The data gathered through the questionnaire provided insight into the students’ perspectives. The information received from the State Community College System’s website consists of a chart showing student results after taking the placement test.
Eleven o’clock- The evaluator assembles the reports for the stakeholders and audience. Chapters 4 and 5 contain reports and findings.

According to Stake (1976), the evaluation process has different purposes. The purpose of responsive evaluation (Stake, 1976) is to evaluate a service provided for people by retrieving and examining information from the service provider(s) and the service receiver(s). Stake (1976) listed some critical concepts of RE as follows:

1. The evaluator should be familiar with the interest and language of the audience.
2. The evaluator may spend large amounts of time learning about the participants.
3. The evaluator should know the concerns and needs of the participants.

The researcher (responsive evaluator) had no preconceived ideas about the investigation's possible results for the current study. Stake (1976) advocated for the responsive evaluator to examine the program's considerations, beginning with the formulation of the research design, and consider the evaluation as a responsive evaluation designed around the issues. Stake (1976) believed the responsive evaluation process might be a quantitative, qualitative, or mixed-method approach. This responsive evaluation was a case study. The data retrieved in the current evaluation study included observations, questionnaires, and documents (Creswell, 1998; Stake, 1983).

Applying Stake’s “clock” identified specific data needs for retrieval from the participants. The data gathered were relevant to the FAME Lab participants' problems, practices, and collaborative experiences and provided the researcher with the appropriate venue to design a strategic plan for addressing the issue. During the research process, the researcher examined existing FAME Lab data and the research data. The researcher contacted stakeholders of the FAME Lab because of their knowledge of the facilities and participants.
The researcher used the DIP in the current study, which provided substantive information and pertinent data for the FAME Lab. Participants interviewed for this study completed a math developmental education course and had access to the FAME Lab. The research assisted with delivery methods and potential improvement outcomes. The Peabody College faculty and program graduates described the DIP process. The faculty articulated the DIP’s primary objective, which was to allow the DIP candidates to address issues through their critical skills and knowledge (Smrekar & McGraner, 2009).

Site Selection/Setting/Research Site

The FAME Lab’s location is a physical setting in a rural community college in Alabama’s southeastern region, available as needed for tutoring, mentoring, and academic support. According to the Faulkner State Community College’s QEP (2006), the establishment of the FAME Lab was to encourage students, faculty, staff, and tutors to interact to improve classroom performance, interaction with peers and tutors, and provide a comfortable environment for students as an integration into the “learning community.” The researcher selected this site because of an educational connection to developmental education. Additionally, the researcher associated developmental education with prior teaching experience in basic study skills and developmental reading. Therefore, the researcher focused on using the FAME Lab for the study. The researcher’s 22 years in education, working with children and adults, provided a strong teaching and learning background.

The site is a rural community college located in Alabama’s southeastern region. According to the United States Census Bureau Quickfacts (2018), the student-teacher ratio of 32:1 has remained consistent for more than five years. The research site is ranked among the top 20% of community colleges within the state for the highest earnings. There are 37.7% part-time students and 62% full-time students. Community college students' average completion rate in
2017-2018 was 11%. In that same year, 88% of community college students were receiving financial aid. The site is a two-year Associates of Arts College with the Carnegie Classification designation of an institution providing undergraduate student classes. The college was one of the 13 two-year colleges established in the southeastern region of the United States due to The Alabama Junior College and Trade School Authority Act of 1963. It is a public institution with an education level of fewer than two years, with 126 faculty members. The college currently has 15 campuses due to a consolidation of three community colleges in 2016. The merger has allowed the college to offer 100 programs of study to the more than 10,000 students enrolled at the community college.

The research site is a two-year community college that houses math tutoring centers. Two-year colleges are known for open enrollment and offering developmental courses to students. The community college also provides the ACCUPLACER® to help place first-year students in the correct math course. The community college has a low cost, where many low-income students attend (Quarles & Davis, 2017). Class sizes are also smaller at a community college. Gaining access to the site is very important in the study. After receiving approval from the IRB, the researcher developed a project description and designed a simple consent form for participants to sign. The project was explained in detail and approved by the IRB before conducting the research. The researcher provided details of this case study research to the IRB. The study must invest time in households, offices, or locations where the data is collected (Creswell, 1998, p. 40).

The researcher sent an email to the Vice-President of Instruction to request access to the campus. The Vice-President of Instruction sent an email letter of consent to complete research and collect data on their site. The Vice-President of Instruction also contacted the math instructor, who was the interim FAME Lab director. The interim FAME Lab director then
emailed the researcher the contact information for another math instructor who assisted in the FAME Lab, and who would be the gatekeeper. The researcher contacted the FAME Lab assistant and discussed access to the site.

**Description of Participants/Data Sets/Agency/Organization**

The study participants included math developmental education students who attended a rural community college in Alabama's southeastern region. The study's other stakeholders were the interim FAME Lab director and a math instructor of the FAME Lab. Twenty-three student participants answered the questionnaire. The researcher recorded the student participants’ ethnicity and age. The percentage of the student participants’ ethnicity who completed the survey was 65% Caucasian, 22% Hispanic, 9% African-American, and 4% Asian. The ages of the student participants ranged from 18 to 21 years old. The study included 65.2% of the student participants age 18, 30.4% of the student participants age 20, and 4.3% age 18–20. The researcher also observed students in the FAME Lab. Chapter 4 describes the students observed during the study.

The researcher selected a rural community college in Alabama’s southeastern region. According to the United States Census Bureau (2018), the southeastern region in Alabama had a poverty rate of 21.6% at the time of the study, with an annual income per capita in the prior 12-month period of $20,625. Some K–12 schools in Alabama’s southeastern region are quite diverse relative to race. Many K–12 schools in the area remain primarily White. Students enrolled in the community college housing the FAME Lab may be from the local city or surrounding rural areas, which have been consistently White students. The research site’s demographics consists of 88% White students, with more than half of the students being women (63.1%). According to the National Center for Education Statistics (2018), the college students’ composition included 77% of students age 24 years and younger. The college's enrollment was 4,968 in 2017 because of a
recent merger with two other state community colleges. The location of the FAME Lab is in the main building of the college. The FAME Lab site, additional classrooms, and instructors’ offices are on the second floor in the Administration Building. The location of the administrative offices is on the first floor.

The FAME Lab hosts 20 computer terminals with a server, network printer, desks, and chairs. The FAME Lab utilized PLATO software and other software supplied with current textbooks at the time of the present study. MATHCAD was available on all 20 computer terminals within the FAME Lab. Dry-erase boards were visible within the FAME classroom. Learning "pods" were set up (one round table + four chairs = one Pod) for tutoring and group study.

**Ethical Issues**

The researcher considered Creswell's (1998) discussion for researchers to respect the research site and gain the authority to gain access to it; therefore, a letter was written to the Vice-President of Instruction to complete research on the campus. According to Stake (2004), the researcher should consider ethical issues while gathering information from the student participants. The researcher was aware of the interview process and how interviewing involves “invading” the privacy of those who participate. The co-investigator, an employee of the college, was permitted to send out the questionnaire link to the student participants. Each student participant acknowledged their consent digitally before completing the questionnaire. The co-investigator also disclosed to the student participants the purpose of the study before they answered the questionnaire. The student participants had the choice of declining or withdrawing from the study. The questionnaire was more convenient for the student participants.

Additionally, the researcher considered other ethical issues related to confidentiality and privacy. The researcher and co-investigator assured the student participants the data is was only
for the study. The identities of the student participants would be kept anonymous. Stake (2004) believed the privacy of persons, places, and programs deprives audiences of potentially useful, legitimate information. As a precaution during the research, the researcher and co-investigator ensured the interviewees’ comments and personal data were not disclosed. Participants were given the option to opt-out of answering the questionnaire. As per IRB regulations, students can withdraw from the study. The questionnaire was given to the participants to complete in consideration of the participants' time and convenience.

The participants were not at risk and were 18 years of age and older. The participants signed informed consent before engaging in the research, acknowledging that the rights of the participants would be protected. The researcher respected the time of the participants. After the data were analyzed, the data were kept on the researcher's personal computer and will be discarded after 5–10 years (Sieber & Tolich, 2013). The researcher gathered the data, and it has been reported without suppressing, falsifying, or inventing findings to meet the audience’s or researcher’s needs (Creswell & Creswell, 2017). The researcher also ensures that the report shows no bias or exploits other colleagues' writing. The researcher will share the results of the study with the stakeholders of the community college.

**IRB Process and Consent Forms**

This section establishes the researcher’s plan of action regarding completing the application for conducting the research and approval process sought from the respective IRB. The section also includes the appropriate consent forms, actions, and individual outcomes. An informed consent form for the participants was developed and distributed to the participants. Researchers should acquire composed consent from participants to safeguard the possibility of an insignificant hazard to the members (Steneck & Zinn, 2004). This use of a consent form is one approach to address one ethical concern associated with research, i.e., ensuring participants were
18 years of age or older for participation. The researcher provided the IRB with details of the investigation. The research was reviewed and approved by the University IRB before the researcher conducted any research activities. Participants were allowed to withdraw from the study during the research process. The IRB application provides a descriptive analysis. The researcher provided details because the IRB may not be familiar with the approach to the research. Data acquisition may be in people's homes, workplaces, or other sites (Creswell, 1998).

The IRB reviewed and approved the project description. A detailed description of the study was provided within the university's IRB application, conferring the researcher's approval to conduct the research.

The investigative process included obtaining permission from the IRB. The University’s IRB approval letter for conducting the current research project is located within Appendix C of this dissertation. The researcher completed the appropriate IRB application, communicated the research's IRB process, identified participants, recorded the timeframe for conducting the study, and disseminated the results. The researcher submitted a description of the proposed study to the review board. Student consent forms were completed appropriately by adult students (over age 18) and sent to the co-investigator as approved by the IRB application process.

**Researcher Positionality**

The researcher is genuinely passionate about developmental education, with a concentration on community college students. The researcher looks through the lens of a developmental education instructor. The researcher does not have any social or professional relationship with the participants. The researcher understands and is aware of the needs of developmental education students. The researcher served as an instructor for developmental reading and basic study skills in a community college in the Southeastern United States. The researcher believes every type of assistance and consideration appropriate to further-community
college students’ educational experiences are worth the effort. The researcher is not a full-time employee of the college. The researcher desired to understand more about developmental education students' experiences using the success center tutoring and other services via the FAME Lab. The researcher has past experiences in community college, and the researcher’s past position at the community college influenced the decision to choose developmental education students as the research's focal point. The researcher's employment at the community college also helped the researcher decide to choose this particular site for the study. Finally, the researcher was acquainted with the former Dean of Enrollment Management and the Dean of External Funding and Instructional Services at the research site.

Chapter Summary

This chapter included the following areas of discussion of the focus and scope of the evaluation of the FAME Lab. This discussion included the limitations and delimitations of using the community college as part of the study. The evaluation plan and data collection procedures were discussed. The researcher utilized Stake’s (1976) responsive evaluation model and data collection procedures in this study. Responsive evaluation is more manageable and responsive to the stakeholders’ concerns and issues. The clock strategies' prominent events have been applied where the evaluator has more flexibility based on the situation's needs. The use of Stake’s (1976) RE allowed the researcher to apply this program evaluation approach in seeking problem-solving strategies. The researcher considered program evaluation for the FAME Lab to explore the FAME Lab's stakeholders' issues. The program evaluation was also considered to investigate the crisis regarding students entering community colleges unprepared, especially in mathematics skills relative to the community college’s response in the creation of the FAME Lab.

A description of the FAME Lab and the community college was provided in this chapter. The student participants described in this chapter are developmental education students. The
researcher discussed data sets, program agency, ethical issues, and considerations associated with the FAME Lab’s characteristics in this chapter. This section also included the IRB’s considerations, the study’s procedures, and the researcher’s positionality. This section also consisted of how the data was recorded, organized, and analyzed in preparation for Chapter 4, pertinent to the methodology information appropriately aligned with the responsive evaluation study advocated by Stake (1976).
Chapter 4: Presentation of Analysis of Findings

The purpose of this program evaluation was to explore relationships of the FAME Lab characteristics and specific perceptions of students enrolled in developmental math education courses at a rural community college in Alabama’s southeastern region. The evaluation study’s central research question was the following: What are the perceptions of students about the FAME Laboratory program in meeting the needs of underprepared students enrolled in community colleges? In addition to the central research question, the study examined three specific research questions. The research questions guiding the research were the following:

**RQ1:** What is the perceived influence of the FAME Lab tutoring program on the self-perceived academic performance of students in developmental education?

**RQ2:** What are the perceived factors influencing developmental education students' access and use of the FAME Lab?

**RQ3:** How do students perceive the value of the FAME Lab relative to developmental classes?

Chapter 4 is organized in the following sections for presentation: (a) the description of participants and detailed presentation of the characteristics and demographics of the study participants; (b) the presentation of the study results, including critical analysis and evaluation of the findings relative to the problem statement, the research questions, and the research design utilized in the study; (c) interpretation of results with analysis of emergent patterns and new scholarly considerations; and (d) the Chapter 4 summary. The researcher evaluated the data with a step-by-step process. After collecting the data, the researcher began the evaluation process by organizing the data in the computer. After organizing the data, the researcher read the observation notes to ensure the notes were comprehensible, made extra notes, and formed codes. The notes were then separated into themes. The researcher also disaggregated the results from
the questionnaire and created charts in Google Sheets®, displaying the results. The collection of artifacts gathered from the institution was also used in the narrative to help determine the program evaluation outcomes. Observations, a questionnaire, and a collection of artifacts were each considered in the evaluation of the data. The researcher interpreted the data by looking for the lessons learned and making sense of the data. The information was then written in a narrative form that included tables and figures (Creswell, 1998).

**Description of Participants**

The student participants in this study were developmental math education students who attended a rural community college in Alabama’s southeastern region. These students were developmental math education students who had access to the FAME Lab. Twenty-three student participants responded to the questionnaire and participated in the evaluation research project. The percentages of the student participants’ ethnicity who completed the survey were 65.2% Caucasian, 21.7% Hispanic, 8.7% African-American, and 4.4% Asian. Each percentage is shown in the table below.

**Table 1**

*The Ethnicity of the FAME Lab Questionnaire Student Participants*

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>African-American</td>
<td>2</td>
<td>8.7</td>
</tr>
<tr>
<td>Asian</td>
<td>1</td>
<td>4.4</td>
</tr>
<tr>
<td>Caucasian</td>
<td>15</td>
<td>65.2</td>
</tr>
<tr>
<td>Hispanic</td>
<td>5</td>
<td>21.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>23</td>
<td>100</td>
</tr>
</tbody>
</table>

*Note: N = total sample size, % = percentage of Ethnicity*
The table below shows the age and percentage of the student participants surveyed in the study. The ages ranged from 18 to 21 years old. The study included 65.2% of the student participants age 18, 30.4% of the student participants were age 20, and 4.4% were age 18–20.

**Table 2**

*The Age of the FAME Lab Questionnaire Student Participants.*

<table>
<thead>
<tr>
<th>Age</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>15</td>
<td>65.2</td>
</tr>
<tr>
<td>19</td>
<td>7</td>
<td>30.4</td>
</tr>
<tr>
<td>20</td>
<td>1</td>
<td>4.4</td>
</tr>
<tr>
<td>Total</td>
<td>23</td>
<td>100</td>
</tr>
</tbody>
</table>

*Note: N = Total sample, % = percentage of Age*

**Critical Analysis and Evaluation of Results**

The researcher applied Stake’s (1976) clock model to the current study. The researcher used Stake’s (1976) responsive evaluation to ensure the study was reliable and valid. Therefore, the researcher gathered data through observations, a questionnaire, and a collection of artifacts. The researcher followed the *time* on the clock listed on Stake’s clock model located in Figure 1. According to Stake (1976), within his discussion of functional structure, “and I rush to claim this clock runs clockwise and reverse-clockwise. In other terms, any case may be preceded by another event. Certain incidents co-occur, and the evaluator refers to each case several times until the conclusion of the evaluation” (p. 5). Some of the parts of the clock could be omitted or repeated (Stake, 1976). Stake’s clock model is a list of prominent events occurring within the research process. The researcher applied all the *times* on the clock to the research. The *times* on the clock helped guide the research for the study. The chart (Fig. 1) depicts the clock model...
(Stake, 1976) which includes the prominent events or times in the study. The following discussion sections describe each clock event within the context of the research.

Twelve o’clock- Talk with clients, program staff, and audiences. The researcher also spoke with staff and instructors at the college. According to Stake (1976), stakeholders have an essential role in responsive evaluation. The researcher communicated with the Vice-President of Instruction to receive approval to conduct the research. The researcher also spoke with the math instructor and math division chair- the interim FAME Lab Director. The researcher provided a questionnaire link for the student participants to complete, which addresses the FAME Lab’s attitude. Google Forms® recorded student participants’ responses.

The researcher communicated with the Vice-President of Instruction to inquire about conducting the study at the community college. The Vice-President of Instruction sent a letter of communication approving the research at the community college. The researcher conducted informal discussions with the math division chair (interim FAME Lab Director) and math instructor about the FAME Lab’s operations. At times in responsive evaluation, questions are allowed to emerge during the evaluation process rather than be formulated (Stake, 1976). The math division chair informed the researcher about the establishment of the FAME Lab to assist Elementary Algebra (MTH098), Intermediate Algebra (MTH100), and Pre-Calculus Algebra (MTH112) students. The researcher created a questionnaire for the student participants. The Math Division Chair appointed a Math Instructor to assist the researcher during the research. The community college also required only the co-investigator, an employee of the community college, to interact with the student participants.

One o’clock- Identify program scope. The researcher examined the Faulkner State Community College QEP (2006), which discussed the FAME Lab. The FAME Lab was established to assist math students in Elementary Algebra, Intermediate Algebra, and Pre-
Calculus. The goal of the Faulkner State Community College QEP (2006) asserted the implementation of the FAME Lab within six years of its establishment. The FAME Lab's mission and intent are for students to use the FAME Lab for academic support in math. Within the lab, there are tutors readily available to assist students in math.

Two o’clock- Overview of the program activities. The FAME Lab’s purpose statement implies the lab is to be used as a center to assist students who enroll in high-risk math Classes-

Elementary Algebra (MTH098), Intermediate Algebra (MTH100), and Pre-Calculus Algebra (MTH112). Math developmental education students take Elementary Algebra (MTH098).

According to the Faulkner State Community College QEP (2006), the strategies identified for inclusion in the FAME Lab are listed in the chart below:
Goal 1: To improve student competencies in the following high-risk mathematics courses: Elementary Algebra (MTH098), Intermediate Algebra (MTH100), and Pre-Calculus Algebra (MTH112).

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Improvement of assessment procedures will be implemented to measure student learning outcomes by implementing pre- and post-testing for each high-risk course.</td>
<td>The college implemented this at the beginning of the FAME Lab creation. The community college now does a diagnostic test for math courses. The final exams are based on course outcomes.</td>
</tr>
<tr>
<td>2. A FAME Lab will be established for students in high-risk mathematics courses.</td>
<td>The community college did establish a FAME Lab. The researcher completed observations in the FAME Lab.</td>
</tr>
<tr>
<td>3. The college will adopt the I CAN Learn® Education System to improve student competencies in Elementary Algebra (MTH098) and Intermediate Algebra (MTH100) classes.</td>
<td>The community college did use the ICAN Learn® Education System. The college encountered issues with the program. Now the college is using the Hawkes Learning System for developmental math education students. The Hawkes System is used for elementary algebra and intermediate algebra.</td>
</tr>
<tr>
<td>4. Students in the high-risk mathematics courses will be given access to a Web-Enhanced component for their course for supplemental course material.</td>
<td>The web-enhanced component has been a college-wide implementation.</td>
</tr>
</tbody>
</table>
Goal 2: To improve attitudes toward mathematics for students taking Elementary Algebra (MTH098), Intermediate Algebra (MTH100), and Pre-Calculus Algebra (MTH112).

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Students will become more aware of placement guidelines for mathematics courses and of mathematics course sequencing, which will aid in the completion of program requirements.</td>
<td>The current diagnostic test contains questions on MTH098 and MTH112 and is a resource for placement challenges. Math advisement flowcharts will be given to advisors to show to students during advisement.</td>
</tr>
<tr>
<td>6. The placement guidelines will be improved through the implementation of COMPASS testing and a program that will allow faculty and advisors to electronically review high school transcripts.</td>
<td>The college eventually moved to “COMPASS,” but the state now mandates “ACCUPLACER®.”</td>
</tr>
<tr>
<td>7. Students in the high-risk mathematics courses will be given access to a Web-Enhanced component of each course, which will allow for increasing the level of student engagement.</td>
<td>Implemented Campus-Wide</td>
</tr>
<tr>
<td>8. A tutor training program will be implemented to establish quality tutoring in the FAME Lab.</td>
<td>The QEP Director did receive training, but tutors never received training. The QEP director is no longer working at the community college. The college has no resources to do so now.</td>
</tr>
</tbody>
</table>

The strategies derived from the Faulkner State Community College QEP’s (2006) critical analysis and evaluation, as depicted in Figures 1 and 2, are briefly described here and will be more fully discussed in Chapter 5. These strategies focus on different ways to improve student learning outcomes in the three high-risk mathematics courses.
The first goal is to improve student competencies in the following high-risk mathematics courses: Elementary Algebra (MTH098), Intermediate Algebra (MTH100), and Pre-Calculus Algebra (MTH112). The QEP presents four strategies under the first goal. The first strategy addresses the implementation of the improvement of assessment procedures to measure student learning outcomes. The college proposed to implement pre-and post-testing practices for each high-risk course. The college completed this pre and post-testing practice implementation as a component of establishing the FAME Lab. The college also consistently conducts diagnostic testing for math courses, and final exams are based on course outcomes. The second strategy listed in the Faulkner State Community College QEP (2006), advised the FAME Lab to assist students in high-risk mathematics courses. The Faulkner State Community College QEP (2006) provided information about the FAME Lab's set-up. According to the Faulkner State Community College QEP (2006), “The FAME Lab will be set up to encourage students, faculty, staff, and tutors to interact with students to improve classroom performance, to promote interaction between peers and tutors, and to provide a comfortable environment for students integrated into the ‘learning’ community” (p. 12). The Faulkner State Community College QEP (2006) also indicated that learning pods are established for student collaboration.

The third strategy, the ICAN Learn® program, was used in the FAME Lab's first stages. The college faced issues with the ICAN Learn® program. Eventually, the college invested in another program, which is similar to the ICAN Learn® program. The Hawkes Learning system® has been used for the Elementary Algebra (MTH098) and Intermediate Algebra (MTH100) students.

The fourth strategy under the first goal and the seventh strategy under the second goal is similar. Students in high-risk mathematics courses are given access to web-enhanced supplemental course material. This strategy has been implemented college-wide.
The second goal is to improve attitudes toward mathematics for students taking Elementary Algebra (MTH098), Intermediate Algebra (MTH100), and Pre-Calculus Algebra (MTH112). The second goal also includes four strategies.

The fifth strategy addresses how the college will help students become aware of placement guidelines and sequencing for mathematics courses. Students complete a diagnostic test which contains questions on Elementary Algebra (MTH098) and Pre-Calculus (MTH 112) and is a resource for placement challenges. Math advisement flowcharts will be given to advisors to show to students during advisement.

The sixth strategy addresses the improvement through the implementation of COMPASS placement guidelines. The community college now uses ACCUPLACER®. The state-mandated this program for community colleges for student placement in developmental education classes. The college uses the ACCUPLACER® results to assist with the process of gathering information about incoming students. The FAME Lab also was established to recruit and employ a Mathematics Laboratory Supervisor. The Mathematics Supervisor should have at least a Bachelor’s degree in mathematics, teaching experience, and technology experience.

The seventh strategy addresses where students in high-risk mathematics courses will be given access to web-enhanced supplemental course material. This strategy has been implemented college-wide. Students will become more aware of placement guidelines for mathematics courses and mathematics course sequencing in the fifth strategy. Placement guidelines will aid in the completion of program requirements. Students will complete a diagnostic test which contains questions on MTH098 and MTH113 and is a resource for placement challenges.

During the eighth strategy, the institution plans to implement a tutoring training program to establish quality tutoring in the FAME Lab. The QEP Director did receive training, but the
Director did not train the tutors. The former QEP Director is no longer an employee of the college. During the time of the study, the college had no resources to offer tutor training.

The researcher completed observations during November and December of 2018. The first observation began at 9:55 am. The FAME Lab was not busy at the time. There were four students in the lab, including the lab tutor, who was also a student. The FAME Lab tutor was a White male. The FAME Lab has both students and teachers as tutors. As the researcher made observations, the lab tutor sat at the front table and completed work on a laptop. The other students in the FAME Lab quietly worked on their assignments. The lab tutor was called upon by students as needed.

The first student, a White male, used the FAME Lab and sat alone using a laptop. The second student, a Black male, received assistance from the tutor. The student was wearing jeans and a grey sweatshirt. The tutor, wearing jeans and a black t-shirt, assisted the student for about three minutes. After helping the student, the tutor asked another student if he needed assistance. The other student replied, “No.” The tutor went back to his seat at the front of the room. A few minutes later, the first student in the lab got his materials together, spoke to the other student, and left the lab. The other student continued to work while another student came into the lab. He walked to the sign-in podium and signed-in. He walked over to the FAME Lab tutor and sat down at the computer. The researcher ended the observation at 11:07 am.

During the second observation conducted by the researcher, three students received assistance from the tutor in the FAME Lab. This observation began at 12:32 pm. The four students in the lab included the lab tutor and three other students. The lab tutor was a Black male wearing jeans and a t-shirt. He assisted the students in the lab. The first student was a Black male wearing a grey sweatshirt and jeans. He was reading a book with headphones on his head. The next student was looking at his cellphone. A few minutes later, he began working on an
assignment. He started talking to the first student in the lab. The third student walked over to the tutor. The tutor was sitting at the desk at the front of the room. The tutor was also working on an assignment. After the third student finished talking to the tutor, the third student sat down and continued to do his work. The first student closed his book and then began to pull out work from his backpack. The students continued to work on their various assignments. The third student got up from the table where he was working and packed up his things. He walked over to the sign-in podium and then signed-out. The observation ended at 1:35 pm.

The final observation conducted by the researcher began at 12:35 pm. During the last observation, four students in the lab were receiving assistance. Many of these students were working on their assignments. The lab tutor sat at the lab desk. He was wearing black shorts and a red t-shirt. During the observation, the first student asked for assistance. This student was a White female. She was wearing sweatpants and a t-shirt. The other two students sat next to each other working on an assignment together. One of the students was a White male. He wore a blue shirt and tan khaki shorts. He had earbuds in his ear and was completing work. The third student in the lab wore camouflage shorts and a white t-shirt. The last student sat alone at a computer. She was a White female. She wore blue shorts and a blue shirt. She called on the lab tutor to assist her. He helped her for a few minutes, and then the tutor walked over to the two students sitting together. Another student walked in, talked to the tutor for a few minutes, and then left out of the FAME Lab. The first student left out for a few minutes but later returned. One of the two students working together went to a computer and began working. The observation ended at 1:43 pm.

Three o’clock- Discover purpose and outcomes. The researcher recognized from the literature the need for additional research on the perspectives of developmental math education students who use learning assistance centers. According to Payne et al. (2017), learning
assistance centers are available to (a) improve the performance of students at all stages of academic readiness; (b) encourage the professional growth of developmental educators; (c) establish best practice standards; (d) stress the use of a model to guide practice, and (e) support successful assessment and quality study in programs for developmental education and learning support. The researcher addressed the FAME Lab’s effectiveness and importance relative to developmental education students.

Four o’clock- Conceptualize issues and problems. The FAME Lab has two goals. The first goal is to improve student competencies in high-risk mathematics courses (MTH098, MTH100, MTH112). The second goal is to improve students’ attitudes toward Elementary Algebra (MTH098), Intermediate Algebra (MTH10), and Pre-Calculus Algebra (MTH112). The Faulkner State Community College QEP (2006) also noted that the FAME Lab provides computer terminals for remediation and coursework enhancement. The FAME Lab staff were responsible for downloading PLATO, MATHCAD, and other software on the FAME Lab computers. Learning pods provide space for student collaboration. A pod is a round table and four chairs. The FAME Lab also was established to recruit and employ a Mathematics Laboratory Supervisor. The Mathematics Supervisor should have at least a Bachelor’s degree in mathematics, teaching experience, and technology experience. The supervisor is also in charge of coordinating tutoring sessions, maintaining the FAME Lab, assisting students and purchasing software and equipment. The I CAN Learn System is also a service to be provided by the FAME Lab. The institution plans to implement the goals through eight strategies, focusing on different ways to improve student learning outcomes in the three high-risk mathematics courses.

Five o’clock- Identify data needs. The researcher created three research questions and 15 questionnaire questions for the study. The Dean of Enrollment Management, who formerly served as the Dean of Students of the community college, questioned the researcher's formatting.
After reviewing the Faulkner State Community College QEP (2006), there was a desire for the researcher to acquire data to address the FAME Lab. The researcher gathered data through observations, questionnaires, and a collection of artifacts. The researcher observed the FAME Lab three times during November and December. During the observations, the researcher observed the activities in the FAME Lab. During each visit, students were in the FAME Lab receiving assistance. After reviewing the FAME Lab sign-in sheet for each observation, there was no indication that the lab students were developmental math education students. The researcher gathered data about the functions and activities occurring in the FAME Lab.

Six o’clock- Select observers, judges, instruments, if any. The researcher elected to use a questionnaire as the instrument to gather data. Student participants received the link to the questionnaire in Google Forms®, through their school email. The researcher allowed two weeks for the student participants to complete the questionnaire. A co-investigator also assisted in the research by sending the questionnaire to the students. The community college preferred an employee of the community college to communicate with the students because of the Family Educational Rights and Privacy Act (FERPA) Law. The FERPA Law (Feder, 2013) protects the privacy of students’ educational records. The co-investigator also served as the gatekeeper and assisted the researcher during the study.

Seven o’clock- Observe designated antecedents, transactions, and outcomes. The FAME Lab was created to improve student competencies in high-risk mathematics courses Elementary Algebra (MTH098), Intermediate Algebra (MTH100), and Pre-Calculus Algebra (MTH112). The researcher made observations at the FAME Lab, observing activities at the FAME Lab on three days. The researcher observed the FAME Lab on November 12, November 16, and December 4. The students in the FAME Lab were working on assignments, conversing with
other students, and completing their work. The questionnaire provided results addressing the perspectives of the students who used the FAME Lab.

Eight o’clock- Thematize; prepare portrayals, case studies. The researcher described each student who visited the FAME Lab during the observations. The questionnaire provided questions about the demographics of each participant. Responsive evaluation was conducted in this case study to understand the complexity of the FAME Lab activities (Stake, 2004).

Nine o’clock- Validate, confirm, and assemble reports. The researcher gathered the data through observations, questionnaires, and documentation. The researcher created charts and graphs from Google Sheets® after the collection and disaggregation of data.

Ten o’clock- Examine the gathered information from observations, questionnaires, and artifacts. The researcher examined the data and provided a written report for the research. The data was then reviewed and prepared for the report. The artifacts include documents from the QEP (2006), FAME Lab, the community college, and the State Community College System. The college’s QEP had the FAME Lab’s missions and goals, FAME Lab planning, FAME Lab participation timeline, FAME Lab configuration, and the FAME Lab's proposed implementation. The Faulkner State Community College QEP (2006), also provided the design and timeline of implementing the FAME Lab. According to the QEP (2006), “The FAME Lab was established to encourage students, faculty, staff, and tutors to interact to improve classroom performance, interaction with peers and tutors, and provide a comfortable environment for students to be integrated into the ‘learning community’” (QEP, p. 25). The FAME Lab documentation included the FAME Lab mission and tutoring schedules. The data gathered through the questionnaire provided insight into the students' perspectives. According to the literature, developmental classes coupled with tutoring services help increase achievement in student academics. One tool community colleges have utilized to enhance academic success was to increase the assistance to
developmental education students (Rutschow & Schneider, 2011). The information received from the state community college’s website consists of a chart showing the results of students taking the placement test.

Eleven o’clock- The researcher assembled the reports for the stakeholders and audience. Chapter 4 and Chapter 5 contain reports and findings. The researcher spoke with the faculty about the FAME Lab. As the researcher communicated with the Math Division chairperson for math and engineering about the FAME Lab, he described there was no FAME Lab reporting structure of attendance. Also, at this time, there is no one to whom the FAME Lab reports are submitted. He further explained that the FAME Lab is still unorganized due to the merger and faculty turnover. The QEP goals for creating the FAME Lab are not being applied to the FAME Lab. He explained how new improvements and changes specific to new personnel are expected in the spring of 2020. The stakeholder also replied that there was not a FAME Lab Reporting Structure of attendance.

In the stakeholder response, “I am the interim head of tutoring. The peer tutors and the students attending tutoring must sign in on a sign-in sheet located in a central area in a labeled binder. We send in timesheets for all peer and adjunct tutors at the end of each month. I go up to the tutoring area to check on things. The Math Division Chair’s office and classroom are adjacent to the tutoring lab, and if any technical problems occur, he will usually handle them. If any equipment needs to be repaired, (the Math Division Chair) sends a report to the Instructional Technology (IT) department, and the IT department makes the repairs. The co-investigator also mentioned she (co-investigator) was not aware of any other reports compiled for the institution.”

The chart presented in Figure 4 depicts the questions provided to student participants using a questionnaire for individuals to respond to their specific views of the FAME Lab. Student participants were given a scale of one to ten, with ten being the highest to rate their
overall success opinions. Twenty-three student participants responded to the sixteen questions in the questionnaire. Stake’s (1976) responsive evaluation was used in this study to ensure the research’s validity and reliability.

**Figure 4**

*FAME Lab questionnaire*

<table>
<thead>
<tr>
<th>FAME Lab Questionnaire</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How would you describe your college experience thus far?</td>
</tr>
<tr>
<td>2. What role did the FAME Lab play in your experience?</td>
</tr>
<tr>
<td>3. How many classes were you taking when you used the FAME Lab?</td>
</tr>
<tr>
<td>4. What term did you take developmental reading/math?</td>
</tr>
<tr>
<td>5. What term and year did you begin at this institution?</td>
</tr>
<tr>
<td>6. When did you become aware of the FAME Lab?</td>
</tr>
<tr>
<td>7. How often did you utilize the FAME Lab?</td>
</tr>
<tr>
<td>8. Was the FAME Lab easily accessed?</td>
</tr>
<tr>
<td>9. Would you refer the FAME Lab to other students?</td>
</tr>
<tr>
<td>10. When did you start using the services? (i.e., what week in the term)?</td>
</tr>
<tr>
<td>11. Do you think the FAME Lab had a positive impact on your success in the classroom? Why or why not?</td>
</tr>
<tr>
<td>12. Was the FAME Lab available when you needed it? If not, what would have been the ideal hours for you?</td>
</tr>
<tr>
<td>13. On a scale from 1 to 10 (with ten being the highest), how much influence did the FAME Lab have on your success in Math?</td>
</tr>
<tr>
<td>14. On a scale from 1 to 10 (with ten being the highest), how much influence did the FAME Lab have on your success in your overall academic performance?</td>
</tr>
<tr>
<td>15. What improvements would you recommend for the FAME Lab to help future students?</td>
</tr>
<tr>
<td>16. Is there any additional information you would like to add?</td>
</tr>
</tbody>
</table>

*Note. This figure is a list of the questions provided in the questionnaire.*
Interpretation of Results

RQ1: What influence does the FAME Lab tutoring program have on the self-perceived academic performance of developmental education students? Some organizations have adopted systematic and coordinated support programs incorporating various components to improve student educational outcomes (King et al., 2017). Learning assistance centers such as the FAME Lab create opportunities for success for students. These centers concentrate not only on students developing their learning skills through comprehensive instructional materials but also as sites for faculty development (Arendale, 2005; Hatch & Bohlig, 2016). Figure four includes the student participants’ responses as well as several findings related to the FAME Lab. Regarding whether the FAME Lab had an overall impact on their academic success, seven students responded in the affirmative. If it were not for the FAME Lab, their grade in math would have been lower. Some students surveyed reported never going to or never using the FAME Lab. One student said it is useless to use the Lab without the instructor. Even though there are tutors in the Lab, the student prefers the instructor. The United States has promoted the Achieving the Dream Initiative (2006), which helps place community colleges programs to assist students in either transfer, graduation, or retention. The results of the study refer to the clock of prominent events and how the implications are summarized. Stake’s (1976) responsive evaluation includes the clock of prominent events. The clock of prominent events provides the basis of for the collection and evaluation of data in this study. Stake (1976) stated, “It [responsive evaluation] is an examination based on what people do to evaluate things naturally: they observe and react” (p. 185). Stake (1976) further expressed the following characteristics of responsive evaluation:

- The evaluator plans for observations and discussions.
- The evaluator arranges for a variety of people to observe the program.
- The evaluator develops stories from the audience and other information.
• The evaluator creates brief narratives, portrayals, product displays, and graphs.
• The evaluator reveals what the audience thinks is best in the program.
• The evaluator gathers opinions and feelings from a variety of people who may have opposing viewpoints.
• The evaluator also ensures the data gathered is of value.
• The evaluator gathers reactions from the personnel within the program to confirm the accuracy of the participants.
• The evaluator gathers the response from various authority figures about the importance of multiple findings.

An additional question on the questionnaire asked students to rate the FAME Lab’s influence on their success in Math and the FAME Lab’s impact on their overall academic achievement. The student participants were given a scale from 1 to 10, with ten being the highest. Twenty-one percent of the student participants reported the FAME Lab had an overall impact on their success. Data collected from the questionnaire show that 8.7% of the student participants indicated the FAME Lab influenced their math success at stage six. Notably, 34.8% said the FAME Lab had little or no influence on their progress.

The operations of the FAME Lab were evaluated using Stake’s program evaluation. Stake’s (1976) program evaluation focuses on the implementation and effectiveness of the FAME Lab. The responsive approach recognizes the stakeholders in the program who represent various views.

**RQ2:** What factors influence developmental education students’ access and use of the FAME Lab? In a study conducted by Wurtz (2015) at a Southern California Community College, findings supported the utilization of learning assistance centers (LAC) for improving student success rates. LACs are believed by many to be critical to the academic achievement of students
in community colleges (Wurtz, 2015). LACs on college campuses work to help students academically. The LAC may support writing and math and provide other assistance students may need. According to Wurtz’s (2015) study, many students may not be required to use the LAC and only use the LAC because it is necessary or because of choice. Students who did use the LAC saw academic improvement.

An additional query on the questionnaire asked each participant to report when they learned about the FAME Lab. Learning Assistance Center access is a crucial element of ensuring students get the support they need (Christ, 1971). Eleven of the 23 students responded, “just recently learned about the FAME Lab.” The student participants did not use the FAME Lab in 2018. Two of the 23 students learned about the Lab during 2017. Thirty-eight percent of the students did not use the Lab. The results showed that 8.3% of the student participants used the FAME Lab twice a week. The questionnaire also asked student participants if the FAME Lab was accessible; 52.2% replied yes, 13% responded no, and 34.8% replied maybe. The students had access to the FAME Lab, but the students did not know about the FAME Lab. The student participants just recently became knowledgeable about the FAME Lab.

An additional question on the questionnaire asked students if the FAME Lab was available when the students needed the lab. Forty-four percent of the student participants replied that the FAME Lab was available when needed. The results show that 8.7% of the students did not know about the FAME Lab until recently, and 4.3% of the student participants indicated not seeing the dates available to use the FAME Lab. The responses reflected that 8.7% did not use it, and 13% responded not applicable (N/A). The results indicated that 8.7% of the student participants who had jobs preventing them from using the FAME Lab. The student participants also preferred the FAME Lab to be opened in the morning.
In essence, the data indicate the student participants' report that the FAME Lab was accessible and available. Many students knew about it, but the students did not use the FAME Lab. A small percentage just found out about the Lab. Hunter Boylan (2009) suggests it would be advantageous for the college to provide developmental math students information about the FAME Lab during advisement. Creating a developmental math curriculum team may assist in implementing the FAME Lab services (Bol et al., 2016). The developmental math curriculum team can create pamphlets and other materials to advertise and promote the FAME Lab's benefits.

Christ (1971) suggested publicizing a LAC is to (a) describe the center's programs and services, (b) place an announcement online, in the local or campus newspaper, or television, (c) create a bookmark with a description of the services, (d) inform the math department, counseling center, clubs, organizations, and faculty of the services, and (d) post signs about the LAC on the campus. The college can also promote the FAME Lab by using testimonials or success stories from students who have used the FAME Lab. The visibility of current hours and days of operation on campus and the website is beneficial.

**RQ3:** How do students perceive the value of the FAME Lab relative to developmental classes? Institutions have a role to play when developing and implementing programs to help students reach their academic potential. According to Payne et al., 2017, "Learning centers delivering best-practice approaches can provide a meaningful difference to student success and completion or graduation" (p. 21). Students having the support to reach their goals is also essential. Additionally, many of these students who enter college will enroll in one or more developmental classes (Butrymowicz, 2017; Grimes & David, 1999; Hunter, 2017; Kreysa, 2006; Perin, 2018). One survey question requested students to provide the time frame or list the term the student participants took developmental math. A resulting 39.1% responded Fall 2018;
4.3% responded Spring 2018; 17.4% Fall 2018; and 39% replied “other.” To consider the FAME Lab as an asset to their developmental math course, the students would have to use the FAME Lab’s services.

An additional question asked students to respond to whether the FAME Lab had a positive impact on their classroom success. According to the results, 4.3% responded that the FAME Lab was useless without an instructor in the lab. The results showed that 4.3% of the student participants found that the FAME Lab tutoring service was useful if a student needs help. Rick Sheets (1994) believed that student tutors are just as important as the instructors, only if trained. The training of tutors will enhance the consistency, quality, and credibility of services provided. Another 4.3% responded that the FAME Lab was helpful. The responses included 4.3% of the student participants answering, “Yes, I had no other help,” and 39.1% of the student participants stated, “The FAME Lab did not influence overall math success.” Only 17.4% indicated the FAME Lab influenced their success in their developmental math course.

According to the questionnaire results, it was not a requirement for developmental education students to use the lab. Even so, many students responded how helpful the lab was. Students also responded, recommending the use of the lab to other students. Nine of the 23 students noted taking a developmental math course in Fall 2018, but over half recently learned about the FAME Lab. The number of students using the FAME Lab while taking a developmental math course was low. One out of the nine student participants who took developmental math used the FAME Lab.

The second goal of the QEP was to improve attitudes toward mathematics for students taking Elementary Algebra (MTH098), Intermediate Algebra (MTH100), and Pre-Calculus Algebra (MTH112). The college tried to improve the attitudes of developmental math students toward mathematics by creating the FAME Lab. The community college leaders and teachers
made efforts to make students more aware of the placement guides and enhance the placement testing process. The college implemented the placement test ACCUPLACER®. Faculty members are now working closely with the students in advisement. Advisors provide students with information explaining students’ placements and information specific to each student’s courses (Boylan, 2009). The community college offers various services to all students, primarily because community colleges are open-enrollment institutions. The researcher recommends the community college consider emphasizing the importance of the FAME Lab services during orientation, advising sessions, and classes. This recommendation will enhance the usefulness of the FAME Lab in many ways. First, this recommendation may enable students to take advantage of the opportunity to use the FAME Lab. Also, students may develop stronger relationships with advisors and developmental math instructors. Third, students’ knowledge of the FAME Lab may allow students to take full advantage of the FAME Lab’s services (Christ, 1971).

One extension of scholarship to be considered is a book study of *What Works: Research-Based Best Practices in Developmental Education* by Hunter Boylan. The tutors, instructors, and advisors could then be surveyed on their perspectives of the program. Further research to be considered is the perspectives of the instructors about the FAME Lab. An additional extension for research is to see whether the implementation of research-based and best practices are beneficial for the FAME Lab. The college noted in the QEP the steps to be taken in creating the FAME Lab.

The researcher recommends the college conduct additional research after following the outline of the QEP. The researcher recommends implementing a developmental math curriculum team or task force to help create a developmental math curriculum. The institution may use this curriculum to help guide teaching and provide teaching resources for developmental math faculty. The college should provide the FAME Lab’s mission, goals, and guidelines in the
curriculum. The recommendation is to incorporate in the curriculum a handbook for developmental math education students. Goudas and Boylan (2012) suggested that interventions work differently at colleges based on the implementation. Further research into the developmental math students completing a survey after using the FAME Lab is recommended. The survey will help the administration, FAME Lab staff, and developmental math curriculum team know what changes are needed to improve student services.

**Chapter Summary**

Chapter 4 provided a detailed description of the study participants, the critical analysis and evaluation of the results, and an interpretation of the results. The study participants included 23 developmental education student participants who answered the FAME Lab's services questionnaire. Study participants also included the interim FAME Lab director and math instructor. The chapter also included a critical analysis of the study. The researcher applied Stake’s (1976) responsive evaluation of the study. The researcher used the clock of prominent events to gather, analyze, and report the data. Stake’s (1976) program evaluation application helped reveal the concerns and issues student participants had with the FAME Lab, as shown from questionnaire results. The researcher provided an interpretation of the results in this chapter. The chapter also provided a review of each research question, using emergent patterns and new scholarly considerations.
Chapter 5: Conclusions, Recommendations, and Implications

This chapter provides multiple focused topics of discussion to report the findings, conclusions, recommendations, and implications of the study. The chapter summarizes the significant findings, including an overview of the problem, purpose statement, evaluation questions, significant findings from the literature review, the framework underlying responsive evaluation model, a discussion of the methodology, and a shortlisting of the significant findings. The second section of this chapter’s presentation consists of the criteria and standards for determining evaluative judgments with a conclusive discussion of how the study will advance professional practice. The third section of this final chapter provides specific recommendations and implications for practice. The recommendations and implications for practice are based on the data collection and analysis findings from this evaluation study and articulate selected implications of implementing changes pertinent to practice to support future continuous improvement efforts and advance learning. The third section of this chapter identifies specific educational leadership actions and practitioner actions achievable based on the study's findings. The fourth section presented in this chapter, provides a discussion of the evaluation standards employed within the current study, with adherence to the responsive evaluation model (Stake, 1976) and the client’s response to the evaluation. The fifth section in this final chapter of the DIP details the evaluation process and ethics pertinent to the evaluation study's procedures. The study limitations and reflexivity discussion comprise the sixth section of discussion in this final chapter and focus on the researcher's challenges and lessons. The chapter summary concludes the presentation.

Summary and Major Findings

The findings of the current research indicate that the development of multiple instructional models is crucial for increasing students' academic progress in developmental
education. Many students enter community college and are not prepared to take college-level mathematics courses. Therefore, many students must take non-credit bearing developmental mathematics education courses to prepare them for college-level courses. Community college students who enroll in school often take more than one developmental education course. As a result, institutions are concentrating on creating pathways to assist students who enroll in college underprepared.

The purpose of this program evaluation was to explore relationships of the FAME Lab characteristics and specific perceptions of students enrolled in developmental math education courses at a rural community college in Alabama’s southeastern region. The evaluation study’s central research question was the following: What are the perceptions of students about the FAME Laboratory program in meeting the needs of underprepared students enrolled in community colleges? In addition to the central research question, the study examined three specific research questions as listed below:

**RQ1:** What influence does the FAME Lab tutoring program have on the self-perceived academic performance of developmental education students?

**RQ2:** What are the perceived factors influencing developmental education students’ access and use of the FAME Lab?

**RQ3:** How do students perceive the value of the FAME Lab relative to developmental classes?

The literature review identified critically low numbers of students successfully completing developmental mathematics courses uniquely identified within community colleges. The low numbers are evidenced by ninety-six percent of two-year colleges across the country having students who require remediation courses in mathematics (Butrymowicz, 2017). The FAME Laboratory program represents the type of intervention programs that community
colleges across the United States utilize to increase students’ numbers for successfully completing college developmental mathematics courses. This literature review includes Stake’s (1976) RE clock of prominent events. Stake’s clock events present each occurrence or step in which the researcher performs the research tasks. Tinto’s (1975) theory of departure includes students’ needs that should be addressed for them to be successful. A major finding in the literature review suggests colleges should provide students with support services for tutoring, mentoring, and advising (Sheets, 1994). The literature review also supports learning assistance centers are helpful for underprepared students (Boylan, 1999). There is also the need for developmental education courses and support for developmental education students (Boylan, 1999). The current literature review emphasizes the need for current research initiatives to investigate the role and impact of curriculum creation as an important component in the development of a successful student center (Ormsby and Morrow, 2019). An additional major finding is that research efforts do not provide adequate information regarding the need for a focus on curriculum development in the process of developing learning assistance centers (Boylan et al., 1992).

Stake’s (1976) RE model was applied to this program evaluation. According to Stake (1976), RE is an evaluation of the reactions and behaviors of people. RE is an evaluation process that provides a service and is useful to a program. Stake considered that RE would potentially improve the relevance of the results to individuals inside and around the program. Stake thought that the best approaches to use in the analysis are human beings. Historically, Stake (1976) RE began as a failure to answer specific questions with the program evaluation that was current. After Stake and other colleagues reviewed other evaluation programs, the concept of RE was developed. Stake realized that researchers should collect data in different methods and from various sources. The RE model has been used in past research that includes science (Stake,
2014), evaluating teaching practices in higher education (Kirschling et al., 1995), and professional conferences (Spiegel et al., 1999). Some additional past research that utilizes Stake’s RE model includes evaluating public service organizations (Brix et al., 2017) and the health field has used RE by evaluating policy interventions based on policymakers (Abma, 2005).

The assessment of literacy by RE was analyzed by Cambourne and Turbill (1994). In order to help gather and analyze the knowledge, Cambourne and Turbill (1994) collected data reliably and cohesively, and the book considers the perspectives of students, managers, and researchers implementing the RE model. In his report, Van der Knaap (2006) analyzed the value of evaluating policies and applying performance measures while performing an evaluation. Van der Knaap (2006) thought that organizations should have discussions with workers about policy evaluation. After listening to the discussions of the stakeholders, organizations can make responsive changes. Spiegel et al. (1999) used Stake’s model to analyze a professional conference in which the evaluators participated in the conference and then participated in the assessment. Stakes’ (RE) has been used in other areas of education. The use of RE reveals the effectiveness and value of programs.

The RE model was used in this study to evaluate the FAME Lab program. The RE model is assumed to be an appropriate method for testing programs by sacrificing the concept to maximize its effectiveness. The RE model is a relevant discussion for defining the model’s interrelationships and the data analysis methodology as necessary to support study findings. This study uses Stake’s RE model to review the current policies in place for the FAME Lab, analyze students’ perspectives, and examine the data gathered from the observations, questionnaire, and a collection of artifacts from a rural community college in Alabama’s southeastern region.
The method in which the study was conducted was the application of Stake’s (1976) RE. The RE has twelve steps on the prominent event clock associated with the program evaluation. According to Stake (1976), the events on the clock can be used in any order. The researcher used the prominent event clock to conduct the study. The researcher applied the times on the clock in the order that is presented, starting with the 12 o’clock event. The 12 events on the clock of prominent events are as follows:

12:00 Have a dialogue with clientele, staff, audiences
1:00 Recognize the scope of the program
2:00 Summary of activities of the program
3:00 Determine purposes and concerns
4:00 Theorize issues and problems
5:00 Recognize data essentials, concerns
6:00 Choose observers, judges, resources if any
7:00 Observe designated qualifications, connections, and outcomes
8:00 Create the idea; prepare depictions, case studies
9:00 Confirm or attempt to disconfirm
10:00 Examine and organize for audience use
11:00 Create official reports, if any

RE is an educational assessment if it is focused more specifically on curriculum practices than on planning goals. Stake (1976) describes several characteristics of RE. RE is an educational assessment if it needs input from the audience. Additionally, RE is an educational assessment if demonstrated by the different interest experiences of people interested in assessing the program's progress and failure. The use of RE offered a good basis for incorporating
literature on the need for assessment of services for students entering two-year or community
colleges based on remediation or developmental mathematics education.

The RE was applied to this study because it involves evaluating the critical problems
found by stakeholders, involving the relevant people who are most likely to benefit from the
outcomes of the assessment and be linked to the results of practice. RE also encourages
deliberate interactions and discussion between stakeholders to support a shared understanding of
the problem and possible solutions (Greene & Abma, 2001). RE helps to enhance (Abma, 2005)
the use of RE produced evaluation choices and results for decision-making administrators and
educators to effectively assist students in successfully resolving shortcomings and problems
hampering their achievements in mathematics courses needed to enter college programs.

The researcher chose student participants through purposeful sampling. According to
Creswell (2017), purposeful sampling is used when the researcher chooses people and places for
a study that will allow the researcher to understand the research problem and questions. Student
participants were chosen by students at the community college on the main campus who had
taken a developmental mathematics education course. Twenty-three questionnaires were
collected by the researcher.

The study's major findings are summarized relative to the three specific research
questions guiding the research and including an overall summary of findings. Study outcomes
are presented here relative to the overall responsive evaluation results and interpretive
commentary. In addition to the major research question, the major findings and concise results
are showed relative to each of the three research questions posited for the investigation. The
three specific research evaluation or research questions are outlined below:

**RQ1:** What influence does the FAME Lab tutoring program have on the self-perceived
academic performance of developmental education students? A summary of the findings and
interpretation of the results pertinent to research question one includes the following discussion. The data indicated that the FAME Lab does not significantly influence students' academic performance in developmental education. Three of the students observed were developmental education students. During these observations, students received assistance from the lab tutor. The lab tutor was also a student. This finding was contradictory to the Faulkner State Community College QEP (2006) requirement of a tutor training program initially required for implementation in preparing FAME Lab tutors. None of the lab tutors, as reported by the community college, are trained tutors. Walker (2016) believed there was little change in the success of students enrolled in remedial classes unless the tutoring system had successful tutor training. An additional finding related to the first research question from the survey data indicated that approximately one-fifth (or 20%) of the student participants responded that the FAME Lab did not influence their mathematics courses' success. One outcome of these results has impacted the college to enlist a plan for implementing a tutor training program. The college initially elected to train only the Lab Supervisor. However, this study's results have influenced the college officials to institute a more formal tutor training program. Tutors are essential for the lab, but more importantly, tutor training is critical for a more effective program.

**RQ2:** What are the perceived factors influencing developmental education students' access and use of the FAME Lab? The questionnaire used in the study's data-gathering phase indicated that many students did not use the FAME Lab, even though some students were aware of the lab’s existence. More than half of the students surveyed stated the FAME Lab was easily accessible, although these same students mentioned not using the FAME Lab services. Conclusions and recommendations from the survey response and interviews with stakeholders regarding this second research question indicated the following recommendations: (a) Academic advisors should (during advisement) provide developmental students information specific to
accessing and using the FAME Lab when placed in Elementary Algebra (MTH098); (b) A developmental math curriculum team should create pamphlets and other materials to help advertise and promote the services of the FAME Lab; (c) The college can also promote the FAME Lab by using testimonials or success stories from students who have used the FAME Lab; (d) Current hours and days of operation should be visible on campus and the website; and (e) Future research studies may need to explore the usability of the FAME Lab, further using a longitudinal study of students’ perspectives of the FAME Lab after the implementation of the Faulkner State Community College QEP (2006).

**RQ3:** How do students perceive the value of the FAME Lab relative to developmental classes? Overall, the students agreed that the FAME Lab helped with math classes. The FAME Lab reduced the frustration and confusion the students had in math. The second goal of the QEP was to improve attitudes toward mathematics for students taking Elementary Algebra (MTH098), Intermediate Algebra (MTH100), and Pre-Calculus Algebra (MTH112). The college administration seems to be taking action to improve developmental math students' attitudes toward mathematics by educating students about specific placement guides and improving the placement testing process. Accordingly, the process provides students with practical information for making informed decisions regarding the FAME Lab's effective personal usage.

The use of the RE model was employed to explore the FAME Lab's information and evaluate characteristics within the evaluation purpose and process framework. The rural community college mathematics laboratory located in Alabama’s southeastern region provided the study's setting, and RE (Stake, 1976) was the evaluation methodology used to investigate the problem.

The study examined perceptions of students within a community college developmental mathematics education program relative to three areas of focus: (a) students' expressed access and use of the FAME Lab program services; (b) students' perceptions of the influence of the
FAME Lab program services relative to academic performance levels; and (c) students' perceived value of the FAME Lab program relative to successes in developmental math courses.

The researcher requested approval from the Vice-President of Instruction of the community college to conduct this program evaluation. The study required the researcher to identify three mathematics courses that enrolled community college students for specific data retrieval considerations pertinent to the study: (1) Elementary Algebra (MTH098); (2) Intermediate Algebra (MTH100); and (3) Pre-Calculus Algebra (MTH112). The researcher created a questionnaire for the study’s student participants and conducted a RE (Stake, 2014) of the FAME Lab program to respond to the problem defined for investigation. The RE approach (Stake, 1976) focused on the FAME Lab program and operations and provided the researcher with appropriate strategies to discern results emphasizing three areas of consideration: (1) the examination of program activities rather than program goals or intents; (2) the acquisition of students’ needs, reactions, and information rather than college leaders’ intentions or purposes; and (3) the reporting of differing perspectives in determining the success and failure of the program. The researcher utilized a plan of action involving 12 steps corresponding to the clock-face numbers advocated by Stake (1976) for evaluating the FAME Laboratory program, relative to the significant purpose of assisting students in achieving success within community college developmental mathematics courses. The plan was proposed to college officials and approved for implementation. Actions completed by the researcher for implementing the responsive evaluation plan included the following: (a) soliciting stakeholder participation, communication, and engagement; (b) accessing stakeholders positioned with a vested interest in the FAME Lab, which included the interim director of the FAME Lab, math instructors, and students; (b) Completing responsive evaluation procedures for producing knowledge within the context of stakeholders’ communications of evidence and needs; (c) performing responsive evaluation
activities for providing evidence from stakeholders’ perceptions of the FAME Program’s direct impact on policy and practice by retrieving information from respective students, instructors, and administrators; and (d) obtaining input from stakeholders using the responsive evaluation clockwork relative to the three evaluation questions posited for the investigation. The researcher gathered data through investigating, observing, and reflecting on the observations as a program plan for strategizing, improving, and acting for this research (Stringer, n.d.).

**Criteria and Standards Used to Make Evaluative Judgements**

Responsive evaluation provided opportunities for the researcher to examine perceptions of students enrolled in one or more developmental courses at a rural community college in Alabama’s southeastern region. The researcher based the criteria and standards of Stake’s (1976) evaluation model on making evaluative judgments for this research. Stake stressed the evaluators’ reviews are susceptible to inaccuracies. Stake also revealed ways for the evaluator to handle making judgment errors. Stake (1976) conceded that there is some form of subjectivity involved in program evaluation. Documentation, observation, and surveys/interviews are all essential aspects of the assessment. The “Judgement Data,” as Stake (1976) referred to it, is the way the researcher should present the data. Judgment from the researcher involves errors. The content analysis is the assessment of the documentation. Observations are necessary to help minimize the mistakes of the researcher. Stake (1976) suggested utilizing research from social scientists. For the current study, the researcher applied the evaluation and analysis from Stake’s responsive evaluation (1976) protocol, data collection procedures (Creswell, 1998), credibility (Creswell & Miller, 2000; Lather, 2017), and trustworthiness (Lincoln et al., 1985) for content analysis. As established by Lincoln et al., 1985, trustworthiness involves creating the following:

- credibility- confidence in finding the truth;
- transferability- showing the results can be applied to other studies;
• dependability- showing the consistency of the results and possibly the results; and
• confirmability- the respondents’ results are influenced and not influenced by the researcher (Lincoln et al., 1985).

There are three goals of this program evaluation. The first goal of the program evaluation is to make the program accountable to its decision-makers and other stakeholders. The second goal is to allow administrators and instructors to enhance the delivery of appropriate outcomes of the program (Stake, 1976). Stake (1976) emphasized the concerns of the primary stakeholders. The stakeholders at the community college shared their concerns about developing strategies for improving the FAME Lab. A third goal is to recognize the need to examine one community college’s laboratory approach to address the problem of excessive numbers of students not succeeding in developmental algebra courses and underprepared students taking mathematics courses. During the program evaluation, stakeholders evaluate the evaluator's reviews and engage with the researcher about their questions and complaints (Paolucci-Whitcomb et al., 1987). Stake (1976) suggested that responsive evaluation involves the stakeholders’ opinions about the program.

The study will inform and advance professional practice by exploring the implementation of strategies to assist students who do not complete developmental mathematics courses successfully. This research will add to the literature on the use of assessment in the context of the study investigation. The study will improve the practice by providing options for students entering community colleges unprepared in mathematics skills. This research will also contribute to decision-making evaluative options and findings for administrators and educators to effectively help students successfully overcome shortcomings and problems hindering their learning and performing achievements in mathematics courses required for entering programs of study in college.
The results were communicated to the relevant stakeholders. The researcher shared the results with the stakeholders through email with a slideshow presentation. The results were emailed to the Math Department Chair, math instructor, and Director of Academic Affairs. The researcher shared the 12 conclusions presented in Chapter 4, coupled with additional discussions of the study results. The researcher shared how the results from the study revealed various aspects of the FAME Lab’s services provided to the students.

**Recommendations and Implications of Practice**

The researcher engaged in vicarious experiences to help the reader understand the “feeling” of the program (Stake, 1976). The researcher gathered data through observations and created reports of the observations using a holistic approach. According to Stake (1983), the researcher should take a holistic approach when conducting observations. Henceforth, the researcher provided a complete picture of the observations. The researcher offered descriptive data through charts, graphs, and narratives so the reader may understand the study's sentiment. The researcher acquired the FAME Lab's perspectives from the student participants during the RE research process. This perspective supports the expectations made about the FAME Lab. Responsive evaluation brings attention to conditions to understand the program’s many aspects (Stake, 2004). The RE approach focuses on the needs of the stakeholders who use the FAME Lab. The researcher also recommends the items below to increase the FAME Lab usage in a rural community college in Alabama’s southeastern region.

- Study other learning assistance centers on community college campuses.
- The community college could also complete a book study on Hunter Boylan’s *What Works: Research-Based Best Practices in developmental education*.
- Implement best practices and instructional strategies.
- Add the use of peer mentors in the FAME Lab.
• Evaluate the FAME Lab annually. This evaluation should include students’ opinions of the FAME Lab.

• Provide time for the faculty to discuss effective teaching and learning strategies for developmental education students.

• Create an online early alert system for faculty and developmental mathematics students.

• Create a system requiring the students who take developmental math education courses to use the FAME Lab services.

• Revisit the Faulkner State Community College QEP (2006), and make relevant and necessary adjustments.

• Review each goal and strategy and the implementation of the QEP to fidelity.

• Require mandatory training for the FAME Lab tutors with tutor training criteria.

• Require mandatory training for the FAME Lab Math Tutor Supervisor with tutor training criteria.

Hunter Boylan (2009) suggested best practices to make a thriving assistance center. Boylan and Saxon (1999) also recommended that well-trained tutors will produce the following:

• highly developed coordination of classes and resources for developmental education;

• a systematic review of the development process for improvement;

• integration of developmental education classroom experiences and learning center activities;

• a robust learning assistance center offering student support facilities to curriculum courses;

• a comprehensive collection of institutional resources and facilities; and
learning and tutoring services supervised by an administrator to provide both
group and individual tutoring services (Boylan & Saxon, 1999).

This section focuses on six areas of discussion aimed at administration and faculty members. Conclusions derived from the multiple types of data retrieved by the researcher with accompanying data analyses are highlighted in the following summary statements:

- The FAME Lab currently has a little-known presence at the community college study site.
- The community college official/faculty members must make a concerted effort to ensure students use the FAME Lab.
- Students utilizing the FAME Lab report success and satisfaction in the services provided by the FAME Lab.
- Good advertisement, faculty support, and encouragement may increase the FAME Lab's lack of student usage.
- Future studies to be considered for the FAME Lab could target the retention rates and success rates of developmental math education students.
- The definition of success is students passing developmental mathematics classes.

Meta-evaluation and Evaluation Standards (i.e., trustworthiness and rigor)

The meta-evaluation has its foundation from Scriven’s (2012) checklist. According to Scriven (2012), there is one evaluation specialty of unique importance to the discipline of evaluation and considerable difficulty, probable ties for being the least studied of all. Scriven’s meta-evaluation can be either formative or summative. The program evaluation in this study is summative. According to Scriven’s (2012) meta-evaluation checklist, the list is an outline considered to be covered when completing a meta-evaluation. The checklist includes validity, credibility, clarity, concision, timeliness, effectiveness, cost-feasibility, cost-effectiveness, and
generalizability. The researcher did not obtain an external assessment of the evaluation for the study.

Credibility is the researcher’s guarantee that the information reported in the study corresponds with what the research reveals (Creswell & Miller, 2000; Lincoln et al., 1985). The issue of reliability and validity is essential for this study and in other quantitative and qualitative research. Credibility, established through member checking, minimizes misrepresentation of personal bias (Lather, 2017). The researcher chose two peers to help check the analysis. The researcher asked two individuals familiar with learning assistance labs or developmental education to complete the data check. The researcher was interested in maximizing the amount of trustworthiness potential for the researcher’s study. One member who conducted the data check and analysis is familiar with adult education and learning assistance labs. The second member of the analysis check is an instructor of developmental education students. The researcher’s objectives for the member checking included interpretation of findings and verification from the content analysis of learning assistance labs and academic achievement.

Clarity is ensuring the data is written in a way the reader understands the reports. The researcher met with the peer reviewers face-to-face to review the data and evaluation methods. The researcher emailed the questionnaire results, documents, and other documentation to the peer reviewers. The researcher explained to the individuals their roles as peer reviewers and set a tentative date to meet. The peer reviewers had the opportunity to contribute their views about the analysis of the data. The researcher asked the peer-reviewers to comment on any preconceptions about the subject matter and data. The peer reviewers added to the trustworthiness of the research (Lincoln et al., 1985). To address the aspects of clarity, the researcher completed observations using thick descriptions to achieve external validity. These thick descriptions are setting,
location, atmosphere climate, participants present, bonds established with the student participants, attitudes of the researcher's student participants, and feelings.

The researcher ensured the report was concise while including an accurate and precise responsive evaluation in the process. Chapter 3 lists the steps regarding Stake’s (1976) responsive evaluation. The steps included the 12 prominent events. A triangulation of the data is also an essential aspect of conformability. The researcher triangulated the data by observations, artifacts from the institution related explicitly to the FAME Lab, and a questionnaire. The researcher utilized a co-investigator through this process. The institution required the co-investigator to be a faculty member of the institution to make contact with the students. The researcher collected the thoughts and clarified the study's purpose and outcomes. Lincoln et al. (1985) suggested using another investigator in the process.

The researcher considered the timeliness of the research. The researcher completed the study during the months of October–December of 2018. The researcher ensured there were non-obtrusive methods in conducting the research. As a consideration of the time and convenience for students, the student participants received a questionnaire. The evidence supports establishing the effectiveness aspect of the study. The researcher consulted an additional researcher to test consistency and assess the observations, explanations, and assumptions (Lincoln et al., 1985). The researcher spoke with a peer reviewer who was not involved in the process but was familiar with the research process. The peer reviewer studied the information and provided constructive feedback from the research. The reviewer saw a few inconsistencies, and the researcher contacted the co-investigator and reviewed the artifacts to make the corrections. Johnson and Stake (1996) described the research as the process of assigning first impressions to initial observations and final compilations.
The researcher considered the cost-feasibility of the research before conducting the investigation. The researcher provided snacks and water for the student participants. The researcher purchased a tape recorder for the interviews. The researcher also considered the price of gas for travel to and from the study site. Scriven’s meta-evaluation also includes in the checklist cost-effectiveness. The researcher considered the time, space, expertise, and costs of the study. Instead of interviews, the researcher used a cost and time effective way to complete research with questionnaires. The researcher used the FAME Lab on one campus with twenty-three student participants.

The study exhibits potentially valuable findings to benefit the college in creating improvements to the FAME Lab. Various types of educational venues and multiple types of student populations apply the research model. Future research implications from this study suggest studying students who use other assistive tutoring or laboratory environments such as the FAME Labs at the community college. Researchers can apply this responsive evaluation at other Learning Assistance Centers. The researcher visited the FAME Lab at three different times. The researcher observed the activities of the students who visited the lab. The researcher also sketched a diagram of the lab during the observations. Transferability or generalization allows the reader to connect to possible personal experiences and look deeper into the research. Data may be extracted and may lend invaluable information to the reader (Johnson & Stake, 1996). The study provides thick descriptions that will bring the student participants’ experiences to life. Perhaps readers of this work may feel that they have conducted the same FAME Lab analysis as the researcher. Furthermore, researchers reading this study should reach the same conclusions as the researcher (Creswell & Miller, 2000).

As discussed by Stake (2014), case study research design should walk the reader through the process. The researcher discussed each step in the evaluation process (Liang, 2019) and
explained the research problem. The researcher helps the reader synthesize the data collected and writes the results from the data collected. The researcher was attentive to adhering to all of the considerations related to a meta-evaluation, i.e., the data are valid, credible, clear, concise, timely, practical, cost feasible, and effective, and the research has significant importance. The researcher evaluated the information carefully to ensure that the reader may critically assess the research.

**Reflections on Evaluation Process and Ethics**

As the researcher reflects on the program's evaluation, some areas of concern for the researcher focused on the evaluation process and the evaluation process's ethical considerations. This section provides insightful reflections on the evaluation process and the ethical considerations aligned with the evaluation process. Several exemplars are posited within this discussion to illustrate the ethical and practical considerations of the evaluation process and their illustrative merging for producing a high-quality research study. Initially, the researcher desired to interview the students. The institution preferred the co-investigator, which is an employee of the college, to interview the student participants because of FERPA. As the research continued, time constraints also prevented the student participants from interviewing, and therefore, the student participants answered sixteen items on the questionnaire. Gaining access to the site was very important in the study. After receiving approval from the IRB, the researcher developed a project description and designed a consent form for student participants to sign. The project was explained in detail and approved by the IRB before conducting the research. The researcher provided descriptions for the IRB of the case study. The researcher needed to spend time in locations where data could be gathered (Creswell, 1998, p. 40).

An email was sent to the Vice-President of Instruction to request access to the campus. The Vice-President of Instruction sent an email of consent to complete the research on their site.
and collect data from their students. The student participants read and signed consent before completing the questionnaire. The student participants completed a consent form to ensure the student participants were aware of the process, to avoid any issues when the researcher arrived to begin the study.

The Vice-President of Instruction assigned a gatekeeper for the site. The gatekeeper also served as the co-investigator during the research. During the visit of a case study of observations, questionnaires, and a collection of artifacts, the researcher completed the triangulation of data. During observations, the researcher gathered information by observing people's places at a research site (Creswell & Creswell, 2017). There are advantages and disadvantages to observing others. One advantage is the opportunity to record the action as it happens and study the actual behavior so participants can verbalize their ideas. A disadvantage is, at some point, the participants will not feel comfortable in verbalizing their thoughts, and the presence of an observer may influence the participants’ behavior.

Creswell and Miller (2000) recognized some disadvantages of observations; there is a possible restriction to specific locations and contexts. In those sites, the researcher may find it challenging to develop a relationship or rapport with individuals. As the observer visited and observed the site, the researcher collected field notes of the student participants' actions and conversations during the observations.

Before distributing the questionnaire, the researcher identified student participants and the type of interview questions. The researcher used a questionnaire with open-ended questions to collect data to complete the triangulation process. The student participants signed a digital form to provide consent for the study. The researcher collected questionnaire responses by using Google Forms®. The researcher disaggregated the data using a Google® Spreadsheet with a generation of graphs and charts. The collection of public and private documents also provides the
researcher with a rich source of information. The data is collected and filed so it can be retrieved by the researcher easily.

After collecting data, the next step in the process was to analyze and interpret the data. A collection of empirical data consisted of adding notes, which included the researcher's role in the research, how the researcher felt participating in the activity, and how the researcher related this activity with past experiences. This organization is critical because there was a large amount of information gathered in the study (Creswell, 1998). During the process of collecting data, the field notes were received and transcribed. During this analysis, the researcher determined that data were to be analyzed by hand because of the small amount.

**Limitations and Reflexivity**

The study has certain limitations. The study's limitations are weaknesses beyond the researcher's control that arise in the study (Theofanidis & Fountouki, 2018). Although the researcher made efforts to interview students, the student participants responded to a questionnaire. The student participants' reaction was constrained by the testing instrument's capacity to capture precisely their responses. A limitation of this study is researcher bias (Creswell & Creswell, 2017). The researcher worked as a librarian and instructor for basic study skills and developmental reading classes for a community college; however, it is not the community college in this study. The researcher's experiences may have played a role in using another investigator in the process, journaling the ideas and activities during the study, and recording how the researchers' beliefs and values came into play. The researcher's previous experiences may have affected the interviews with students, faculty, and other stakeholders. During each meeting with the co-investigator, the researcher took notes as well as recorded the observations. The researcher felt more confident in the process using a co-investigator. The co-investigator was able to share insights and ideas about the study and the institution and students.
Lincoln et al. (1985) also suggested that researchers provide attention to the reflexivity of research. The researcher reflected on the research conducted on the FAME Lab and considered adjustments or changes that could have been made during the study. The researcher began the investigation with one community college. The researcher could have possibly used additional community college campuses to include in this study or compare what other campuses of the community college in the southeastern region of the United States were doing for mathematics programs to support math developmental education students. Also, the researcher could have considered completing a longitudinal study with the FAME Lab. The researcher could have also obtained more participants by giving the student participants the questionnaire and giving the questionnaire at different times during the semester.

The researcher learned from this experience the importance of qualitative research, and that sometimes mixed-method research can also help complete research. Also, the researcher learned there could be many topics researched from one research topic. Moreover, the researcher also discovered that it is best to be patient during this process. Finally, the researcher obtained a better understanding of the decisions first-year community college students make when considering what course sequences to take for math.

**Chapter Summary**

The findings of the current research indicate that the students participating in the study at a rural community college in Alabama’s southeastern region had positive perceptions of the FAME Labs and the students participating in the study benefited from their experience with the FAME Lab. Additionally, the institution has established the FAME Lab and continued efforts to advertise and implement the FAME Lab to assist in academic achievement. Building connections across campus and on other campuses may enhance employees' motivation to share the services provided by the FAME Lab. Such relationships will also keep the FAME Lab visible so students
may be more receptive to its services. The community college should also consider developing tutoring sessions for students with disabilities. The developmental math curriculum team should create guidelines and strategies on how to address students’ disabilities. The college should offer workshops to students and adjunct instructors each term. Also, the information in the developmental math students' handbook should be written in various languages for international students. The college should consider extending student services to students who do not speak English. In short, the developmental math curriculum team should work with the FAME Lab Supervisor and create policies to assist students with disabilities and international students. Included in these policies are the services concerning the FAME Lab.

Although the structural frames are particularly applicable to understanding the FAME Lab, the institution will need to incorporate broader ways to implement and develop the FAME Lab services. The institution needs to understand and address the fact that systemic change resonates with the core of each person’s experience within an organization’s structure. For example, students are essential stakeholders concerning services; thus, the institution needs to share what services are available in a venue frequently accessed by students (e.g., the university newspaper). Additionally, the institution leaders and faculty members should remember to comply with implementing the FAME Lab strategies presented in the Faulkner State Community College QEP (2006), and recommendations should be consistent and systematic when considering the best practice for developmental math students. The current study strategies and findings may provide potential transferability for future research studies. This study may inform future considerations by researchers focused on developmental mathematics and student preparation in community colleges across the United States. These recommendations may provide the pathway for ensuring the success of students who have traditionally been unable to perform competently in developmental mathematics courses and provide the essential skills and
opportunities necessary for opening paths to successful experiences for students in college-level classes.
Appendices
Appendix A: Glossary of Terms
Community College- as regionally accredited institutions, which primarily award the associate degree as their highest award (American Association of Community Colleges, 2019).

Developmental education- A field of practice and research within higher education with a theoretical foundation in developmental psychology and learning theory. It promotes the cognitive and affective growth of all postsecondary learners, at all levels of the learning continuum (Arendale, 2007).

Developmental mathematics course- 1. Pre-collegiate mathematics courses that are designed to prepare students for the study of college-level mathematics, as defined by entrance requirements of the institution. Levels of developmental mathematics courses vary from basic arithmetic through any prerequisite course(s) for calculus (Duranczyk et al., 2004). 2. Instruction that may contain one or more of the following topics: arithmetic operations, math symbolism, geometry and measurement, functions, discrete math algorithms, probability and statistics, and deductive proofs. 3. Specialized mathematics instruction for students who do not meet entry into a college-level mathematics course (Arendale, 2007).

Remediation- consisted of strategies to help underprepared students acquire the skills and knowledge needed to move into college-level courses (Bailey et al., 2016).
Appendix B: References


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Appendix C: Evaluation Plan and Instrumental
1. How would you describe your college experience thus far?

2. What role did the Student Services Center play in your experience?

3. How many classes were you taking when you used the FAME Lab?

4. What term and year did you begin at this institution?

5. What term did you take developmental math?

6. When did you become aware of the FAME Lab?
   How often did you utilize the FAME Lab?

7. Was the FAME easily accessed?

8. Would you refer the FAME Lab to other students?

9. When did you start using the services? (i.e. what week in the term)?

10. Do you think the FAME Lab had a positive impact on your success in the classroom? Why or why not?

11. Was the F.A.M.E Lab available when you needed it? If not, what would have been the ideal hours for you?

12. On a scale from 1 to 10 (with ten being the highest), how much influence did the FAME Lab have on your success in Math? 

13. On a scale from 1 to 10 (with ten being the highest), how much influence did the FAME Lab have on your success in your overall academic performance?

14. What improvements would you recommend for the FAME Lab to help future students?

15. Is there any additional information you would like to add?

Thank you for your assistance
Appendix D: IRB and Consent Forms
Consent Form

Title of study: Assessment of knowledge of Developmental Education Students

Researcher: La Shannon Hollinger

Institute: University of West Florida

I. Federal and university regulations require us to obtain a signed consent for participation in research involving human participants. After reading the statements in section II through IV below, please indicate your consent by signing and dating this form.

II. Statement of Procedure: Thank you for your interest in this research project being conducted by the staff members of The University of West Florida. By this time, one of the investigators should have described the procedures for you in detail. Basically, I am conducting interviews as part of a research study to explore the relationships associated with the achievement of students who take developmental education courses at a rural community college in the southeastern region in the United States. You will find a summary of the significant aspects of the study being described below, including the risks and benefits of participating.

Carefully read the information provided below. If you wish to participate in this study, sign your name and write the date. Any information you provide to us will be kept in strict confidence. If you have any questions or concerns regarding this project, please contact Dr. Carla Thompson in the College of Education and Professional Studies Department at The University of West Florida at (850) 473-7327 or by email at cthompson1@uwf.edu.

I understand that:

(1) In this study, questions will be asked about my experience in the FAME Lab. This will take about 45 minutes of your time. The method for conducting this study will be through open-ended interview questions. It is anticipated that necessary follow-up interviews will be conducted during the semester.
(2) You are free to choose to participate in the study. You may refuse to participate without any loss of benefit which you are otherwise entitled to. You may also refuse to answer some or all the questions if you do not feel comfortable with those questions.

(3) The information provided by you will remain confidential. No one except the investigator and co-investigator will have access to it. Your name and identity will also not be disclosed at any time. A number will be issued to you during the interview and interview questions. However, the data may be seen by the Ethical Review Committee and may be published in a journal and elsewhere without giving your name or disclosing your identity.

(4) No one under the age of 18 can participate in the study.

(5) I may discontinue participation in this study at any time without penalty

III. Potential Risks of the Study:

   (1) The subjects will not experience any type of activities or experiences different from their normal encounter in everyday lives.

IV. Potential Benefits of the Study:

   (1) Examines perceptions of developmental education students
   (2) Contributes to literature
   (3) Formulate guidelines for instruction and curriculum development

V. Statement of Consent: I certify that I have read and fully understand the Statement of Procedure given above and agree to participate in the research project described therein. Permission is given voluntarily and without coercion or undue influence. It is understood that I may discontinue participation at any time without penalty or loss of any benefits to which I may otherwise be entitled. I will be provided a copy of this consent form.

________________________________________
Participant’s Name (Please Print)

________________________________________    _____________________
Participant’s Signature                           Date

L Hollinger
Ms. LaShannon Hollinger

April 12, 2018

Dear Ms. Hollinger:

The Institutional Review Board (IRB) for Human Research Participants Protection has completed its review of your proposal number IRB 2018-162 titled, "Community College Developmental Education Student Perceptions of a Student Success Service Center: A Case Study," as it relates to the protection of human participants used in research, and granted approval for you to proceed with your study on 04-05-2018. As a research investigator, please be aware of the following:

* You will immediately report to the IRB any injuries or other unanticipated problems involving risks to human participants.

* You acknowledge and accept your responsibility for protecting the rights and welfare of human research participants and for complying with all parts of 45 CFR Part 46, the UWF IRB Policy and Procedures, and the decisions of the IRB. You may view these documents on the Research and Sponsored Programs web page at http://research.uwf.edu. You acknowledge completion of the IRB ethical training requirements for researchers as attested in the IRB application.

* You will ensure that legally effective informed consent is obtained and documented. If written consent is required, the consent form must be signed by the participant or the participant's legally authorized representative. A copy is to be given to the person signing the form and a copy kept for your file.

* You will promptly report any proposed changes in previously approved human participant research activities to Research and Sponsored Programs. The proposed changes will not be initiated without IRB review and approval, except where necessary to eliminate apparent immediate hazards to the participants.

* You are responsible for reporting progress of approved research to Research and Sponsored Programs at the end of the project period 11-28-2018. If the data phase of your project continues beyond the approved end date, you must receive an extension approval from the IRB.

* If using electronic communication for your study, you will first obtain approval from the authority listed on the following web page: https://uwf.edu/offices/institutional-communications/resources/broadcast-distribution-standards/

Good luck in your research endeavors. If you have any questions or need assistance, please contact Research and Sponsored Programs at 850-474-2824 or 850-474-2609 or irb@uwf.edu.

Sincerely,

Dr. Mark Rolsen, Assistant Vice President for Research and Director of the Office of Research and Sponsored Programs

Dr. Ludmila Cosio-Lima, Chair, IRB for Human Research Participant Protection
Letter of Study Approval at Coastal Alabama Community College

La Shannon Hollinger
University of West Florida
Doctoral Student

Dear Ms. Hollinger,

I am in receipt of your request to complete research for your Doctoral Degree by utilizing the F.A.M.E. Lab students at Coastal Alabama Community College. In your description to me, you outline your intent to interview students in order to collect theoretical/conceptual data regarding the success of this developmental education tool. In addition, you will be working with Coastal Alabama Community College’s Math Division Chair/Instructor, Mr. Tremaine Pimperl.

Please accept this letter as permission to complete your research at Coastal Alabama Community College through the direct supervision of Mr. Pimperl. I trust that you will follow all established guidelines and parameters written into your proposal forwarded to me on June 18, 2018.

I wish you the best of luck in working through this dissertation process and much success in the future.

Sincerely,

Patty Hughston
Vice-President of Instruction & Workforce Development