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# A Mixed-Methods Investigation of Problem-Based Learning and Technical Students in General Studies Course at a Midwest Technical College

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# A Mixed-Methods Investigation of Problem-Based Learning and Technical Students in General Studies Course at a Midwest Technical College

by

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Dr. Robyne Elder, Dissertation Chair — 4-18-19 Date

Dr. Frank Giuseffi, Committee Member — April 18, 2019 Date

Dr. Robert Steffes, Committee Member — 4-18-19 Date

Declaration of Originality

I do hereby declare and attest to the fact that this is an original study based solely upon my own scholarly work here at Lindenwood University and that I have not submitted it for any other college or university course or degree here or elsewhere.

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## Abstract

This study investigated the relationship between problem-based learning, motivation and engagement (as measured by the Motivational and Attitudinal scale) self-directedness, and academic achievement of technical students enrolled in general studies courses at a Midwestern technical college. The intended purpose for the study was to identify if tactile learners, who currently spend 75% of their program in hands on instructional courses, would benefit from the implementation of a PBL model in general studies courses. Career Technical Education prepares students for the workforce. Creating an academic learning platform that mimics technical instruction where students solve real life problems can encourage students to take an active academic role in learning. This study highlighted if the PBL model in general studies courses creates an academic change in learning for technical students. Faculty and student's perceptions on topics surrounding traditional and PBL were compared and analyzed. Of the 34 technical students who completed the questionnaire, two students participated in interviews. The 12 faculty members who participated in the faculty focus group expressed interest in including the PBL model into current curriculum based on previous classroom observations and the need increase engagement and interest in academic content covered. A comparison analysis based on the *t*-test highlighted differences in student summative assessments before and after PBL was implemented, however; no differences were concluded from end of course student surveys conducted by the institution before and after PBL was implemented.

This study opens with an insight into the characteristics and representation of an adult learner. Additionally, the study aligned innate attributes and characteristics

displayed by adult learners to self-directedness, engagement and motivation and overall facets of problem-based learning based on research included in the literature review. Throughout the study, the researcher found both the students' interviews, survey responses, and faculty focus group feedback were helpful and that possible changes were necessary to increase student retention and other barriers technical students encounter when enrolled in general studies courses.

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# Chapter One: Introduction

## Introduction

Research referred to adult learners as information seekers and did not need the constant governance, as in traditional learning formats. According to writings by Socrates (480 B.C.) and as cited in Isenberg (2007), "Adults past learning experience contributes to new learning through reflective and critical thought" (p. 14). Adults came to the classroom intrinsically focused on learning what they needed to know and knowing why they needed to learn it. This alone inclined the learner to be self-directed in their learning, adding to current knowledge. Teachers of adult learners must consider their audience and create a comparable atmosphere, which complements the adult's prior learned experiences. Creating comparable atmospheres must be inclusive of the theory of Andragogy - the art and science of helping adults learn - coined by Knowles (1984), which aligned to reflect the six assumptions and eight process of how adults learn, all concluded as 'Building Blocks' for the adult learning experience (Henschke, 2013). Henschke (2013) referenced the following constructs as direct derivatives of Andragogy:

*Six Assumptions of Adult Learners*

1. Concept of the learner- Adult learners need to know why they need to learn something new. Institutions must take this into account when designing curriculum
2. Role of the learner's experiences-Adult learners are responsible for their own decisions and learning. Faculty must consider creating class activities that will incorporate life experiences. This can be a valuable resource.

3. Readiness to learn, aligning learning with development- Adults learning needs must be addressed early in the learning continuum to ensure success of the learner.
4. Orientation to learning-Adult learners tend to be motivated to learn. Curriculum should be process based versus content based.
5. Motivation to learn- There is an intrinsic value for the adult learner as a personal payoff.
6. Adults need to know-Adult learners need to know why they need to learn something. This included all external and internal gains including negative implications for information not learned. (Knowles, 1984, p. 9)

Historically, the passive absorption of information and teacher-directed activities were the traditional platform deemed acceptable for the educational system. This traditional method of instruction, pedagogy dated back as early as the seventh century according to Knowles, Holton, & Swanson (1998). The term pedagogy descended from two words 'paid' which refers to 'child' and 'agogus' which means 'leader of.' The word pedagogy was defined as the art and science of teaching children and unveiled the organization of tradition education (Knowles, Holton, & Swanson, 1998). During that era, monastic schools deemed this instructional model as the guiding light for the induction of young men into the priesthood. Additionally, it was during this period this model of pedagogy symbolized the platform for formal education. Several assumptions emerged regarding learners, which established the overall premise for the current educational framework

(Knowles et al., 1998). Table 1 displays the pedagogical assumptions created during the seventh century, which later reared as the overall educational model.

Table 1

*Four Pedagogical Assumptions*

| Pedagogical Assumption | Characteristics |
|---|---|
| Dependency on the leader (Teacher) | The learner was unable to learn because he or she did not know their learning ability. |
| Learning need must be subjected-centered | Leader provided information relative to subject-matter content only. |
| Only extrinsic motivation | Incentives and fear-based stimulus |
| Prior learning irrelevant | Teacher determine what information would be learned whether or not students had prior experience |

In contrast, as the pedagogy model continued as the keystone for academia, controversy arose as the guiding principles for instruction clashed with the ideas of teaching adult learners. Knapp, a German grammar school teacher coined the term andragogy in the 1800s to represent an education platform utilized by Plato (Knowles et al., 1998). This definitive phrase rested until German theorist Rosenstock-Huessy revived the term in 1925. To revitalize themselves and their country Rosenstock-Huessy posed andragogy as the only method for Germany, which after World War I, was dispirited and degenerated (Henschke, 2009, p. 3). Table 2 displays the andragogical process model, in contrast to the traditional learning model utilized by most educators.

Table 2

*Eight Process Elements of Andragogy*

| Element | Pedagogical approach | Andragogical approach |
|---|---|---|
| Preparing the learners for the program | Minimal | Provide information<br>Prepare for participation<br>Help develop realistic expectations<br>Begin thinking about content |
| Setting the climate | Authority-oriented<br>Formal<br>Competitive | Relax, trusting<br>Mutually respectful<br>Informal, warm<br>Collaborative, supportive<br>Openness and authenticity<br>Humanness |
| Involving learners in mutual planning | By Instructor | Mechanism for mutual planning by learners and facilitator |
| Diagnosing their own learning needs | By Instructor | By mutual assessment |
| Translating the learning needs into objectives | By Instructor | By mutual negotiation |
| Designing a pattern of learning experiences. | Logic of subject matter<br>Content units | Sequenced by readiness<br>Problem units |
| Helping adult learners manage and carry out their learning plans. | Transmittal techniques | Experiential technique (inquiry) |
| Evaluating the extent to which the learners have achieved their objectives | By instructor | Mutual re-diagnosis of needs<br>Mutual measurement of program |

*Note:* Information from Knowles, Holton, and Swanson (2005, p. 51).

Additionally, several theorists became acquainted with andragogy and continued the resounding tone and concept that signified differences in adult instruction. Eduard

Lindeman described the idea of teaching adults as a process of problem-solving and not learning subjects (Knowles et al., 1998). Furthermore, the theorist contended teachers should not speak from the hierarchical educational platform, but guide the learning process through inquiry and information from various spheres of knowledge (Knowles et al., 1998). Generally, differences existed between pedagogy and andragogy, but they both made extensive contribution to the then-current learning continuum.

Andragogy respected adult learners' prior knowledge by "moving from the teaching to the facilitation of learning" (Knowles, Holton, & Swanson, 2005, p. 58). Problem-based learning created the instructional platform open to collaborations of prior experiences, knowledge, and doingness to be incorporated in the instructional learning approach (Patel, 2011). Instructors must conceptualize what type of experience they want students to have in adult learning courses. According to Brookfield (1986), and as cited in Galbraith (1991), facilitators of adult learners should incorporate the following six principles for effective instruction:

*Six Principles for Effective Learning*

1. Participation is voluntary; adults engage in learning as a result of their own volition.
2. Effective practice is characterized by a respect among participants for each other's self-worth.
3. Facilitation is collaborative.
4. Praxis is placed at the heart of effective facilitation; "learners and facilitators are involved in a continual process of activity, reflection upon activity,

collaborative analysis of activity, new activity, further reflection, and collaborative analysis, and so on"

5. Facilitation aims to foster in adults a spirit of critical reflection.
6. The aim of facilitation is the nurturing of self-directed, empowered adults. (p. 6)

These principles must be included in all adult learning instructional formats. Adult educators should possess knowledge of content, knowledge of learners, and knowledge of methods for an effective learning in the classroom (Knox, 1980). This coincided with Henschke's (2013) rendition of the adult learning experience. The inclusion of the Building Blocks must be part of the learning continuum and curriculum design to aid adults in learning. Facilitators must create welcoming, trusting atmospheres, open for dialogue.

There are four pillars to consider when creating successful learning formats for adult learners. The learning experience should address learning to know, learning to do, learning to live together, and learning to be (Isenberg, 2007). Including these pillars in learning environments encompassed all aspects of the learning continuum. Adults returning to the class may have lost various skills conducive to memory and concentration. With this is mind, consideration of course design may be necessary where the doingness guides learning. Facilitators must also keep in mind many adults may be embarking on a somewhat fragile journey. However, according to Knowles et al. (2005), "They have exhibited successful learning in other parts of their lives so, the potential for self-directedness exists, but they will need strong support initially" (p. 89). Therefore, it is imperative learning contracts are created. Learning contracts allow the learner to be a

part of their own learning plan. According to Knowles et al. (2005), "learning contracts are a way to engage learners to take charge of their learning and to communicate their plan to the facilitator" (p. 254). Moreover, these learning contracts could increase the students' learning abilities to align with course-level outcome desires, helping to bridge learning gaps.

**Purpose**

The purpose of this study was to investigate the relationship between the problem-based learning (PBL) model, academic achievement, engagement and motivation, and self-directedness of technical students in general studies courses. The researcher conducted a mixed-method study using open-ended interviews, a student Likert scale survey, focus groups, and teacher observations. Another aspect of the study was to compare the traditional learning model to the PBL model using institutional end-of-course surveys and student evaluation data. Participants for this study included Midwest Technical College students enrolled in the fall, spring, and summer semesters of 2016-2017, 2017-2018, and fall of 2018-2019 semesters of General Psychology and Sociology. General studies faculty consisting of 10 members also participated in the study. Both social sciences offerings, psychology and sociology courses were selected based on previous in-class observations, institutional end-of -course student survey responses, and student evaluations. Then-currently the courses were required for all technical students seeking associate and bachelor's degrees; further, it was in these courses where students were observed as disengaged, not motivated, and in some cases disruptive in nature. These characteristics were reflected via student end-of-course survey responses and unfavorable summative assessment results. The majority of the general education

curriculum fosters the paradigm of the traditional learning format. Facilitators introduced new content through didacted instruction, non-engaging with minimal interaction, and peer to peer learning (Gleason et al., 2011). This traditional learning format aligned to the behaviorist theory where instructors defined classroom activities and content arrangements, climate, and information learned (Inal, Akkaymak, & Yildirim, 2014). This learning framework could unravel tactile learners' creative abilities which built on then-current knowledge and experiences and drove the replication of unwarranted non-valued general studies course that many students sought refuge from when seeking career technical education. This sentiment resounded in the resentment of some technical students enrolled in general studies courses without understanding the value that aligned to their technical journey. On the other hand, the learning theory that seemingly resonated with the tactile student's end goal was the cognitive theory approach. Jackson (2009) cited Grippin and Peters (1984) as stating, "The human mind is not simply a passive exchange-terminal system where the stimuli arrive and the appropriate response leaves [behavior theory]. Rather, the thinking person interprets sensations and gives meaning to the events that impinge upon his consciousness" (p. 21). The problem-based learning model was inherent in the utilized authentic problems as the framework for learning content and critical thinking strategies (Schaefer & Gonzales, 2013).

The researcher sought to understand if the PBL model increased student engagement, academic achievement, and self-directedness of technical students enrolled in general studies courses. The researcher used thematic analysis for the qualitative component to identify commonalities and main themes and a *t*-test for difference in means to analyze the difference among variables for the quantitative data.

**Rationale**

There was a considerable body of literature on problem-based learning and facilitation; however, there was minimal student engagement, self-directness, and academic achievement of technical students taking general studies courses. Notably, a study by Willis (2002) examined the design, implementation, and assessment of problem-based learning in general psychology courses; however, information related to tactile students' kinesthetic in nature remains in infancy. The researcher hoped to help bridge the gap in understanding the possible relationship between problem-based learning, academic achievement, motivation and engagement, and self-directedness of technical students in general studies courses.

Career Technical Education programs apply hands-on skilled trades and technologies in preparation for high-demand career fields, but with the inclusion and integration of traditional core academics general studies, the doingness lays dormant allowing rote memorization to return to its common place, the classroom (Rojewski & Hill, 2014). Then-current curriculum at the Midwest Technical College included general studies courses coupled with theory and shop classes aligned to specific trades for students seeking certifications, associates' or bachelors' degree paths. Required general study courses were introductory in nature. This included sociology or psychology, composition I and II; and a series of algebra courses, trigonometry, physics, and calculus depending on the program.

For the purposes of the study, the researcher focused on psychology and sociology courses offered as a pilot to evaluate if modifying then-current general studies (teacher-centered) learning format to problem-based learning (student-centered) format

was adequate grounds for modifications. Then-current general studies courses gave way to traditional teacher-centered learning approaches. Youngeun, Choi, and Anderson (2016) referred to this approach as "The Talking Textbook," which denoted the teacher's use of lectures to disseminate information in achieving student learning outcomes. Problem-based learning was widely known and used in a variety of disciplines to ameliorate a student's soft skills (Kadir, Abdullah, Anthony, Salleh, & Kamarulzaman, 2016). Historically, tactile students enrolled in general studies courses carried the undertone of non-relevance regarding these courses as a facet to program completion. Midwest Technical student comments extracted from 2016 and 2017 end-of-course surveys and classroom observations rejected the need for social science courses exhibiting some classroom protest. From the researcher, previous observations and classroom evaluations identified student disengagement, disruptions, inattention, and lower grades on content retention assessments. Many students denounced the general studies courses as a waste of time, with no alignment or relevance to their major. Technical students' perceptions of general studies courses needed purpose and program value. This symbolized Vrooms' (1964) expectancy-valence model, as cited in Shaw, Tham, Hogle, and Koch (2015), where students weighed the upcoming educational experience or the program against personal expectations and value. Students must believe what they are learning is useful, and attributes to goal attainment (Shaw, Tham, Hogle, & Koch, 2015). These components were extremely important for adult learning platforms supportive for student success and learning gains.

Problem-based learning attributed to the active engagement of students pushing forward the understanding of knowledge rather than utilizing rote memorization as a tool

for content proficiency (Gleason et al., 2011). This instructional model alone aligned with concepts and characteristics of andragogy. This instructional model alone aligned with concepts and characteristics of andragogy in that students take responsibility for personal growth; thereby, being proactive in pinpointing learning needs, formulating methods of data collections, and implementing learning strategies for evaluating learning outcomes (Abraham, Hassan, Damanhuri, & Salehuddin, 2016). Then-current trade curriculums included 15 weekly hours of tactile instruction under the guidance of skilled industry expert facilitators (Midwest Technical College, 2017, para. 3). Problem based learning was a constructivist, self-directed, collaborative, and contextual process guiding students towards an active learning process strengthening questioning, teamwork, critical thinking, and problem resolution skills (Gudduz, Alemdag, Yasar, & Erdem, 2016).

Based on individual career pathways at Midwest Technical College, students could take one or two general studies courses in concert with trade classes totaling up to 24 credit hours within a semester (Midwest Technical College, 2017). The importance of this study was for the researcher to learn if creating general studies courses with problem-based learning concepts and activities related to student engagement, motivation, academic achievement, and self-directedness of tactile learners.

**Research Questions and Hypotheses**

**Research Question 1**: Which PBL activities helped students comprehend the subject content?

**Research Question 2:** What facilitation methods used by teachers align with the problem-based learning model and the traditional model?

**Research Question 3**: What are faculty's perceptions of the problem-based learning model in general education courses in a technical college in relationship to student motivation, academic achievement, engagement and self-directedness.

**Research Question 4**: What are students' perceptions of problem-based learning vs. traditional models?

**Hypothesis 1:** The will be a difference in end-of-course evaluations and summative (final) assessment scores between the traditional learning model and PBL model.

**Hypothesis 2:** There will be a difference between self-directedness in the problem-based learning model vs. the traditional model.

**Definitions of Relevant Terms**

**Active Learning -** Instructors long embraced active learning techniques as a means to engage students with developing information literacy skills. These techniques could include almost anything students did beyond passive listening. Examples of active learning techniques included brainstorming, hands-on technology, cooperative learning, and inquiry-based learning (Bond, 2016).

**Autonomous motivation** - Involved the experience of enacting with a sense of volition and choice; for instance, conducting an activity for its inherent interest and enjoyment or for personal importance. Controlled motivation, on the other hand, referred to feeling pressured to do something; for instance, conducting an activity to get a reward or to feel pride (Baeten, Dochy, & Struyven, 2013).

**Currency of programs -** Currency means programs must keep pace with the needs of the industry, the rapid changes of technology; shifting social expectations; shifts

in legislation and regulation of different fields; the changing expectations of the regulators and participants in higher education (students, academics, government, and accrediting bodies) (Moswela & Chiparo, 2015).

**Engagement framework -** Engaging staff is a prerequisite for engaging students; respectful and supportive relationships were crucial; students being encouraged to take responsibility for their learning; and scaffolded support and clearly communicated expectations enabled students to develop knowledge, understandings, skills, and capacities of a high standard (O'Shea, Stone, & Delahunty, 2015).

**Problem based learning** – Problem based learning (PBL) is an instructional and curricular learner-centered approach that empowers learners to conduct research, integrate theory and practice, and apply knowledge and skills to develop a viable solution to define a problem (Wilder, 2015).

**Self-Directed Learning** – The definition of self-directed learning (SDL) describes a process in which an individual takes the initiative, with or without the help of others in diagnosing their learning needs, formulating goals, identifying human and material resources for learning, choosing, and implementing appropriate learning strategies and evaluating learning outcomes. (Knowles, 1984)

**Student engagement -** Engaging students, regardless of delivery method (i.e., lecture, seminar, video, or online), should help students learn and apply knowledge while in class. Strategies employed to engage students were most commonly termed active-learning methods or approaches (Marshall, Nykamp, & Momary, 2014).

**Talking textbook -** Teacher's use of lectures to disseminate information to students to achieve student learning outcomes (Youngeun Choi1 & Anderson, 2016).

**Technical college -** To provide students with the opportunity to acquire specific job-related skills at levels which would allow them progress into industry in their chosen fields (Moswela & Chiparo, 2015).

**Summary**

The purpose of this study was to investigate the relationship between problem-based learning, academic achievement, self-directedness, motivation, and engagement of Midwestern technical students enrolled in general studies courses. It is imperative institutions of higher learning understand the importance of creating academic environments and curriculum favorable for adult learning (Saar, Taht, & Roosalu, 2014).

Facilitating curricula and methods of instruction in formats that are trusting, respectfully and welcoming of prior experiences gives rise to learning platforms full of critical thinkers, information seekers and meaningful engagement, making students ready for real-life (Bohonos, 2014). Midwestern technical students pursued hands-on majors, which gave rise to self-regulating characteristics metacognitively, motivationally, and behaviorally active, in their own learning processes (American Journal of Pharmaceutical Education, 2014). Self-regulated learners could set goals, plan a course of action, select appropriate strategies, self-monitor, and self-evaluate their learning. They were also intrinsically motivated to learn and reported high self-efficacy for learning and performance (Zimmerman & Kitsantas, 2005). Creating academic learning platforms, which continue the self-regulating traits of technical students is vital. Teachers must create curricula that tap into student interest and abilities to comprehend and retain content material (Gleason et al., 2011). The learning model must be heavy laden with goals and purpose, alignment to personal objectives, and be problem centered. The

assignments must be challenging enough to strengthen student critical thinking and cognitive skills transitioning these attributes into application (Gleason et al., 2011). As in technical offerings, the content should reflect real-world situations and applications.

Chapter Three sheds light on the origin of career technical education providing relevant literature on shifts, which took place to integrate academia into the curriculum. Moreover, the literature offers insight on creating curriculum, which aligns to characteristics of the adult learners and reflects the knowledge and skills students needed to be successful in the 21st-century workforce. Additionally, the literature provides a blueprint for utilizing problem-based learning as the learning format in designing successful career technical education programs.

# Chapter Two: Review of Literature

## Introduction

In many states, Career Technical Education had become the rallying cry for evaluating student success in technical careers. According to Gibney (2014),

> teachers and policy makers in Tennessee view CTE classrooms as critical focal points in the learning pipeline, where postsecondary preparation and skill attainment intersect to unlock the full range of possibilities for students during and after high school. (p. 21)

Additionally, there was a measurable approach to interlace general education and career technical education core academic standards with technical skills attainment and 21st-century skills, a move that defied traditional barriers between 'gen-ed' and CTE classrooms (Gibney, 2014).

The topics reviewed in this chapter begin with the history and inception of CTE, including the legislative push for vocational education and training. Moving through the literature offers specific topics aligning the theory and practice of didactic frameworks to then-current theories and applicable learning approaches for today's technical education students.

## History of Career Technical Education

In the late 1800s and early 1900s, American education strictly focused on teaching to the elite (Moore, 2017). According to Perry and Wallace (2012), core courses including language, math, science, and history were traditionalized as "formal education and primarily offered to the wealthy and socialites of that era" (p. 35). Classical subjects requiring rote memorization as the instructional device included Latin and Greek sonnets.

These were featured as additional ingredients to academic accomplishments holding little value or practical use (Moore, 2017, p. 17). This prescriptive control created the learning continuum unaligned to commonalities familiar to students from rural and low socioeconomic upbringings. According to Perry and Wallace (2012), "Most children during this era attended school only for a few years with a small percent attending college" (p. 35). Moore (2017) concurred, citing Liberty Hyde Bailey (1904), Dean of Agriculture at Cornell University, who described the educational blueprint's rural curriculum as, "The child lives in one world and goes to school in another world" (p. 18). In addition, Moore (2017) stated, "What was learned was often of little value or of practical use in a rapidly developing industrial nation that still had agrarian roots" (p. 7). Perry and Wallace's (2012) view was the same, further stating, "The classical approach to school should be withdrawn allowing for a hands-on philosophy to prepare the massive number of students for employment in industry after graduation" (p. 35).

Apparently, this was the sentiment throughout the early 1900s. The focus during this period centered on building industries being workforce ready and not learning feudal history or Greek sonnets (Perry & Wallace, 2012). It was not until the role of education and the need to increase the workforce joined 250 leading business leaders and educators, including Thompson's (1916) and Barlow's (1967) comments, books and articles regarding the restructuring of education's canvas prompted educational reform (as cited in Barlow, 1967). Upon disbanding the classical approach to education with the hands-on-philosophy, this concept birthed the idea of vocational education. Perry and Wallace (2012) cited, "Public schools of the early 1900s funded by the Smith-Hughes Act of 1917, bore the responsibility for preparing compliant and reliable workers to meet the

high demands of factories, mills, offices, and stores" (p. 35). Subsequently, much has not changed regarding the need for education reform and educational guidance towards instruction meeting the needs of the then-current climate.

Over a century later, American education was still under construction. According to Rutschow and Crary-Ross (2014), "As globalization and technological change remake the labor market, it has become increasingly clear that the United States must improve educational and workforce training programs if we are to remain competitive" (p. ix). Furthermore, Rutschow and Crary-Ross (2014) stated higher levels of academic knowledge and attributes were required in traditional blue-collar fields, where increased technological advancements warranted higher skill competencies.

The canvas of the nation's economic system was built on the technical abilities of skilled workers and the then-current spacious skill gap implied the need for overall concerns (Rosendin & Gielczyk, 2018). However, the common scripts from today's teachers, school administrators, and counselors resounded the unifying construct encouraging four-year college degrees as the "right" path and perhaps the only path to success, but the one-size-fits-all approach was not a viable route (Tkaczyk, 2015, p. 87). The author continued stating, "Our role is to assist students in their exploration of educational paths exposing students to the complete spectrum of learning and career opportunities available in today's global economy" (Tkaczyk, 2015, p. 87).

**Career Technical Education**

Many students' perceptions of career technical education had been tainted by the educational system's promotion of career success through the matriculation of four-year institutional branding (McPhail, 2018). Career Technical Education was continuously

overlooked and put aside by educational experts and policymakers. According to Kostora (2015), “Technical education is an often overlooked or a disregarded option for students finishing up high school” (p. 20). In addition, Kostora (2015) cited a research study from the National Education Association (NEA) which stated “51 percent of high school students do not go to college and 28 percent do not graduate from high school. What many of these students do not realize is that they are not alone or out of options” (p. 20). In the same fashion, 40% of adult students who entered Adult Basic Education programs were bombarded with below level academic deficits in literacy, math, and writing, all necessary to achieve core competencies required by educational credential agencies (Rutschow & Crary-Ross, 2014, p. ES-3). In total, around “70 percent of the U.S. labor force lacks a bachelor's degree” (Kostora, 2015, p. 20).

The Carl D. Perkins Vocational and Applied Technology Education Act of 1990 stated career and technical education, which was used interchangeably with vocation education, was preparing students for occupations outside the four-year and post-graduate level instruction requirements (Kitchel, 2015). Kitchel (2015) stated since the inception of this act, there was an increasing need for technical students to be academically prepared for job-related professional challenges regarding the 21st century workforce. According to McPhail (2018), educators and policymakers must understand dated societal philosophies and traditions branding the ‘You have made it’ stamp on four-year college graduates has flawed the path of the educational system. Perry and Wallace (2012) equally agreed stating, “young people are not benefiting from the traditional model that emphasizes going to a four-year college as the best or only route to success, based on research findings from the Pathways to Prosperity Project” (p. 38). Moving into

the second decade of the 21st century, it was time to discard dated policies, frameworks, paradigms, and assumptions categorizing technical education as subpar and bring forth the critically important subject matter, career success hovering the nation's educational and economic well-being.

Career technical education had been and was still the nation's core to society's economic prosperity (Weingarten, 2014). Students pursuing career technical education chose a non-traditional path diverting from four-year post-secondary education to workforce driven pathways of career technical education. Students enrolled in career technical education courses began the hands-on facets of skilled theory immediately. The tactile application was the guiding force to technical proficiency in which they sought. According to Lynch (2000), as cited in Aliaga, Kotamraju, and Stone (2014), "Historically, the main feature of career technical education curriculums would follow the '50-25-25 rule,' requiring students to spend 50% of their time in shop, 25% in closely related subjects, and 25% in academic subjects" (p. 138). In many career technical education programs, this curriculum still stood, however, through educational modifications and successive reforms, this design proved insufficient in preparing students with the academic skills conducive to successful postsecondary education (Aliaga et al., 2012).

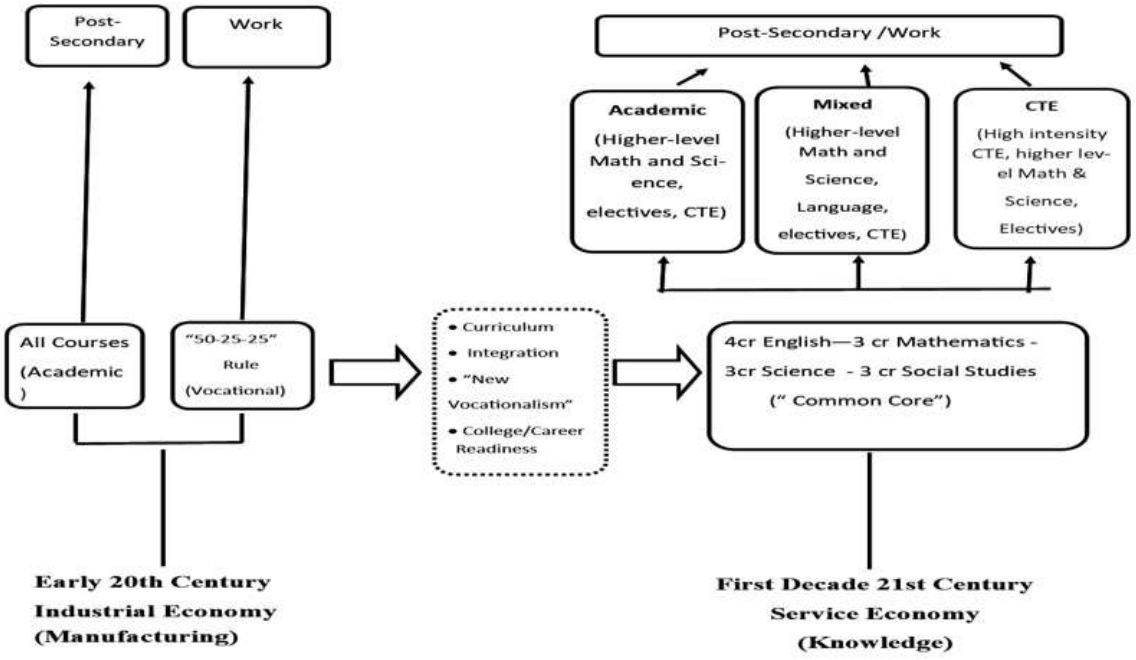


*Figure 1*. Paradigm shift in public high school career technical education.

Perna (2018) stated then-current career focused training was heavily integrated with rigorous coursework elevating the standards of achievement and the expansion of career possibilities. Technical education exposed students to demonstrative and tactile skills relevant to job-specific careers (Oviawe, Uwameiye, & Uddin, 2017). The decision to pursue hands-on instructional education may have implied that the traditional lecture-based formats and teacher-centered concepts of instruction were not of interest, and found less beneficial, or not in line with 21st century's student's ideas of career readiness. According to Rojewski and Hill (2017), as a society we must "situate career-technical and workforce education curricula to anticipate rapid changes in workplace demands and ensure student outcomes will be lasting and durable in the 21st-century workplace" (p. 180). Employers sought skilled workers possessing a wide range of knowledge including critical thinking and reasoning skills, communication that was innovative and creative, 'knowledge technicians.' Technical education curriculum evolved, not only adding

academic rigor to skilled programs, but expanding the knowledge and competitive advantage of technical students.

**Revamping Career Technical Education**

Historically, career and technical education (CTE) programs focused solely on technical instruction directly related to workforce preparation (Fletcher, Lasonen, & Hernandez, 2014). This charge limited and nearly excluded academia or general studies courses from CTE programs. It was not until the 1990s academia was deemed a necessary component to encapsulate the overarching need for academic-rich curricula to prepare students for the 21st century workforce (Fletcher et al., 2014).

The Carl Perkins Career and Technical Education Improvement Act of 2006 was enacted to increase the quality of technical education in the United States of America, and employability was the focus. Integrating academic knowledge with career technical education programs would ensure students were career ready and academically knowledgeable in reading, writing, and mathematics (Bottoms & Sundell, 2017). Students enrolled in technical vocational courses were taught by facilitators mainly skilled in technical content areas with limited skills in academic pedagogy (Ayonmike & Okeke, 2017). This type of instruction normally took place in what was considered an 'interactive learning environment.' According to Gudduz, Alemdag, Yasar, and Erdem, (2016), interactive learning environments provide a different approach to create active learning processes. Lai and White (2014) stated students involved in interactive learning environments create platforms for group-oriented behavior. Further, students listen to one another, sharing the same focus of attention and the engagement in coordinated activity is extremely high (Lai & White, 2014). This type of surrounding strongly

influences the constructivist learning theory whereby students are active in building and organizing information (Baeten et al., 2013). Self- determination and autonomous motivation are characteristics presented by students when the learning environment nurtures the basic psychological needs for autonomy, competence, and relatedness (Baeten et al., 2013).

Traditional academic courses are facilitated in a lecture style approach giving the perception of efficiency based on the large amount of information the facilitator disseminates to the class (Hines, 2017). According to Hines (2017), most of the time students will not retain lecture-based information due to student's perception of relevance and the methods of delivery. In addition, Hines (2017) cited in most cases facilitators use the same methods and techniques of instruction used when they were in school. Unfortunately, these two types of learning environments are the current makeup of technical vocational learning platforms. Rarely would there be an automotive instructor facilitating a general psychology course based on the current qualifications of the Higher Learning Commission.

According to the Higher Learning Commission (2016), qualified faculty teaching general education courses, or other non-occupational courses, hold a master's degree or higher in the discipline or subfield. Furthermore, "if a faculty member holds a master's degree or higher in a discipline or subfield other than that in which he or she is teaching, that faculty member should have completed a minimum of 18 graduate credit hours in the discipline or subfield in which they teach" (Higher Learning Commission, 2016, p. 3). Technical vocational students are seemingly hands-on, and content motivated. According to DeFeo (2015), technical vocational students took technical education classes because

they thought they would learn something useful, they were interested in the subject matter, or they had related career aspirations. Moswela and Chiparo (2015) stated the aim of technical education is to provide students the opportunity to acquire specialized skills thus sustaining economic growth in technical and industrial areas. The program and curriculum design in technical vocational institutions are set to promote a systematic and imaginative approach (Moswela & Chiparo, 2015), but how do technical vocational students fair when the general studies courses are delivered in the traditional lecture-based format? According to Hines (2017), teaching methods based on the presentation (lecture) approach, give the appearance of efficiency because the presenter covers a large amount of material, but many times content retention is a factor. Students must have the knowledge and wherewithal to apply information presented in a fashion that exhibits content mastery. Hines further stated student involvement is the key and "hands on" and "discovery" are the techniques to use. Traditionally, general studies courses are designed to be teacher-centered. Additionally, Hines (2017) claimed traditional lecture base facilitation is a complete waste of time and students would not retain nor restate information nine months to a year later.

Taking this into consideration, Gudduz, Alemdag, Yasar, and Erdem (2016) offered problem-based learning as a resolution to the traditional lecture-based instruction method regarding general studies classes. Gudduz et al. (2016) stated the problem-based learning approach presented several advantages, such as improving students' engagement in learning and fostering higher-ordered thinking in skills. Designing general studies classes with real life context where students investigated uncertainties and problems

created a constructivist, self-directed, collaborative, and contextual learning process (Gudduz et al., 2016).

Midwest Technical College (a pseudonym), founded in 1907, located in the urban area of St. Louis Missouri, offered programs in five main divisions: Automotive, Electrical, Construction, Information Technology, and Manufacturing (Midwest Technical College, 2017). For over 100 years, Midwest Technical College had been the technical hub for thousands of students looking to enter the skilled labor workforce. Midwest Technical College's decision to offer associate degrees caused administration to broaden the academic offerings and include general education courses; thereby, equally emphasizing non-technical skills to develop a well-rounded and adaptable future employee (Midwest Technical College, 2017, para. 3). According to Li (1999, as cited by Fang, 2018), "There are broad and narrow understandings of general education. General education in a broad sense includes nonmajor education as well as major education, while it in a narrow sense includes only nonmajor education indirectly linked to professional preparation" (p. 69). Moreover, Piergiovanni (2014) concurred that general education courses promoted critical thinking and reflective skills. Ranken's general education offerings included introductory level of mathematics, English, social science, and communications. Many students were unaware of the significance general education courses offered to career preparation. According to Peckham (2013), common core standards included English, mathematics, social sciences, and communication courses and represented knowledge and concepts required to succeed in college and careers. Author Peckham (2013) further stated general education components were the make-up and extension of elements required for industry certification. Students were alarmed

upon learning success in general education courses was the determining factor for technical program awarded certification. This could be remedied if the learning platform incorporated an integrated curriculum, where the information could intertwine. According to Fang (2018),

> If the major course is taught with a certain breadth and depth, students would adopt the strategy of using knowledge from their major course in their general education course and using knowledge from their general education course to reflect on the major course (p. 68).

This modification mimiced many elements and characteristics of a problem-based learning model. Major course theory consumed over 75% of a student's time in a technical program, leaving 25% to general studies courses. This theory included applying information learned in situational and problem-focused contexts and in many instances, utilizing facets of general studies content. Curriculum must be inclusive of general studies courses and highlight the principle reasons for inclusion. Career technical programs must be value added with respect to the student's purpose for study.

**Career Technical Programs & Problem Based Learning**

Career technical programs were designed to teach skilled occupations. Technical classrooms were situated in a fashion where theoretical concepts and application met. Students participated in aspects of the problem-based learning model throughout skilled major courses. Students were continuously engaged, collaborating on various methods and techniques seeking problem resolutions. Whether the subject was automotive maintenance, electrical, plumbing, or information technology, curriculum was designed to engage the student in problem resolution (Hyslop, 2014). With the increase of

academia in technical classrooms, the tactile experience diminished to the humdrum monotonous climate of the traditional teacher-centered lecture style delivery. This was where many students regressed and academically declined in general studies courses, as compared to technical classes. Over 50% of the day was filled with hands on activity, team communication, collaboration, and self-directed study (Hyslop, 2013). The traditional classroom setting was instructor scripted, many times arranged in a pedagogy fashion with desks aligned mimicking K-12 seating charts, with limited doingness of the student.

With adult learners, the understanding was many students were well informed and were self-directed in some respect as to the need for information. As cited in Yeo (2005), "Problem based learning requires instructors to re-examine his/her role as content expert and reconsider the delivery power taking place in the classroom" (p. 99). Problem based learning allowed the student the autonomy to learn by doing with the guidance of the facilitator. Researcher Yeo (2005) further concluded this design empowered learners to raise questions challenging facilitators on existing issues to the problem at hand. Problem based learning was defined as an investigative process where students try to solve problems and issues (Gudduz et al, 2016). It was this method of instruction that best met the career technical students' needs.

The makeup of a problem-based learning curriculum began with the problem context. This problem or situational challenge related to social, cultural, and usually a physical structure. This was mainly the premise for technical discovery in career technical programs and aligned with then-current practice in technical courses. According to Handelsman, Miller, and Pfund (2007), active instructional approaches

demonstrated to be more engaging for student producing greater academic achievement. PBL was developed over three decades ago for medical education (Searight & Searight, 2009). Since the inception of this learning model, "many educational researchers have established problem-based learning (PBL) as a total approach to education – both a product and a process – from a pedagogical instructional strategy to skills development to assessment" (Chan, 2016, p. 25). The author continued and stated, "Problem-based learning seeks to encourage this deep learning approach by recognizing that real-world, ill-defined problems serve as a stimulus for student activities" (Chan, 2016, p. 26). Equally, Hack, McKillop, Sweetman, and McCormack, (2015) agreed:

> problem-based learning is a student-centered approach designed to facilitate cooperative learning and encourage students to engage in deep learning. Students learn best when they are actively involved in the process and ample evidence exists that demonstrates the value of a problem-based approach. (p. 220)

This format for learning invited student to apply past experiences to course content coupled with the innate ability to offer insight. Chan (2016) stated problem-based learning:

> gives students an opportunity to work in groups, to take responsibility for their own learning and to experience the feelings of accomplishment; and teachers facilitate rather than instruct. Unlike traditional teaching where teachers provide facts and assess students' ability that relies on memorization, PBL encourages deep learning. (p. 26)

The ability to lead inquiry and solve problems, all-while engaging in cooperative learning were typical traits of adult learners. Adult education happened best through

situational inquiry and not through the study of subjects (Lindeman, 1926). The author continued expressing the backwards instructional model used for educating adults. The adult learner had pre-determined the goals and purpose for learning; however, conventional education learning models charged the instructor with the starting point of inquiry Lindeman (1926). According to Knowles et al. (2005), "It was these insights, concepts and research findings regarding adult learning which created an integrated framework and methodology of Andragogy" (p. 38).

**Andragogy**

The central question of how adults learned the attention of scholars and practitioners since the founding of adult education as a professional field of practice in the 1920s (Merriam, 2001). What seemed alarming and may have caused this attention was the regression taking place once the adult learner entered the classroom. Prior to taking on the ideas of educational enhancements, the adult was self-directed, responsible for one's own life until the decision to learn new concepts took hold. According to Knowles (1984), "Adults may be totally self-directing in every other aspect of their lives, as workers, spouses, parents, citizens, leisure-time users, and the minute they walk into a situation labeled 'education' they hark back to their conditioning in school, role of dependency" (p. 9). Knowles (1984) continued, "If adults are treated like children, this expectation conflicts with their much deeper psychological need to be self-directed and their energy is diverted away from learning to dealing with this internal conflict" (p. 9). The six assumptions underlying andragogy described the adult learner as someone who (a) has an independent self-concept and who can direct his or her own learning, (b) has accumulated a reservoir of life experiences that is a rich resource for learning, (c) has

learning needs closely related to changing social roles, (d) is problem-centered and interested in immediate application of knowledge, and (e) is motivated to learn by internal rather than external factors. The defining attributes of this theory included: acknowledging that learners as self-directed and autonomous and that the teacher is a facilitator of learning rather than presenter of content (Knowles, 1984).

One problem with the teacher-learning encountered under the behavioral and cognitive realms was that teaching and learning transpired in the same uniform approach, regardless of subject matter. The instructor, who was deemed the guardian of knowledge, stood before the class, lectured and put forth knowledge, often with minimal participation or interaction on the part of the learner. The student's ability to retain this knowledge was then checked periodically (in the form of an examination or quiz). The problem here was that a short time later the student most likely forgot everything that he or she learned or committed to memory for the examination. Moreover, there was some research that demonstrated that the lecture approach, which was common under the cognitive realm, did little to promote student learning, as stated by Birzer (2004). Learning on the part of adults constituted much more than a uniform structured environment, as advocated by these behavioral and cognitive theoretical frameworks. At the time of this writing, college students come from diverse backgrounds, including ethnic, race, age, gender, sexual orientation, life experiences, and general cultural orientation. Furthermore, individual college students may approach learning from different learning strategies and styles. The attraction of higher education was on the rise. Baby boomers increasing returned to the classroom in pursuit of additional degrees (Parks, Evans, & Getch, 2013). In recent years, there was an increase in this new type of classmate, called the ‘Adult Learner.’

The percentage of adult learners aged 25 years and older have increased in recent years compared to the number of younger college students entering the classroom (Wax, 2015).

**Adult Learner Characteristics**

The blueprint of the adult learner sets them apart from today's traditional students enrolled in college. The adult learner's motivation was one of the highest elements for college enrollment. According to Wax (2015),

> Often their motivations may be related to work. Adult learners, for example, may have found that their careers stalled, perhaps because they lack a degree or have failed to keep up with changes, such as technology, in their fields. In fact, adults may face the choice between going back to school or being laid off or fired. (p. 39)

Additionally, many adult learners may wear numerous hats while enrolled in college courses. These posts have included the role of a spouse, parent, and full-time care-giver, etc., all which could consume a considerable amount of time and effectuate some form of guilt if existing responsibilities conflict (Wax, 2015).

Moreover, it was these additional roles that incited the adult learner to seek multifaceted learning platforms, where their characteristics and traits could be realized and relate to more doingness and less about factual knowledge. For this reason, it was imperative institutions of higher learning modify the then-current instructional format to embrace the diverse learning styles of the adult learner and the societal needs of content application in today's workforce.

**Traditional Learning Format (Teacher-Centered)**

To improve academic achievement among CTE programs called CTE institutions to integrate higher standards of academic mastery in core academic subjects, including reading, math, and scientific concepts and processes (Park, Pearson & Richardson, 2017). Some would argue these standards and associated measurements diminished the tactile experience and reverted to the humdrum monotonous climate of traditional teacher-centered, lecture style delivery, and coursework not required for skilled technicians. According to Park et al. (2017), "today's student will enter a workplace with rigorous demands for effective cognitive and communicative knowledge and skills" (p. 193). This would suggest students had the skills set and ability to integrate information learned in an applicable manner.

In the majority of general studies courses, classroom environments were guided along traditional teacher-centered pathways disseminating basic theoretical information; whereby, rote memorization and unfashionable curriculum design was prevalent. Social science courses were built on disseminating vast amounts of information, historical names, dates, facts, and theories, which in many instances were less attractive and receptive to the audience and students (Aidinopoulou & Sampson, 2017). According to Knowles (1984), the andragogical model described the adult learner as "self-directed in nature, "One who has arrived at a self-concept of being responsible for one's own life, being self-directed" (p. 9).

In courses of this nature, many (technical) students failed to accelerate in general studies courses, as tactile majors. In technical courses, over 50% of the day was filled with hands on activity, team communication, collaboration, and self-directed study

(Midwest Technical College, 2017). On the contrary, the traditional classroom setting was instructor scripted, many times arranged with a primary flare (Qureshi & Ullah, 2014). Desks were aligned mimicking K-12 seating charts limiting the doingness of students. As a result, students did not actively engage in learning and assessment activities that promoted their historical/critical thinking development (Gaughan, 2014). Moreover, Aidinopoulou and Sampson (2017) stated, "school teachers adopt traditional teaching strategies, using most of the classroom time for lecturing and assessing students' ability to memorize content" (p. 237). In addition, "this type of learning leads students to be passive in class, to memorize, repeat, and rely on notes given by the lecturers" (Kadir et al., 2016, p. 169). This traditionalistic practice "leads students to be passive in class, to memorize, repeat, and rely on notes given by the lecturers" (Aidinopoulou & Sampson, 2017, p. 169). In theory, this may cause students to revert to pedagogical characteristics of dependency and the need for guidance demanding to be taught.

**Leadership Theories**

Leadership theories laid the groundwork for effective schools since the development of education. Significant research existed that contributed to philosophical behaviorists dating back to the mid-19th century that attributed good leadership characteristics were an unlearned feature woven into the DNA of great leaders and not gained from outside entities (Carlyle, 2001). Additionally, Carlyle (2001) believed based on the circumstances, a variation in leadership styles would surface. Today, leadership theories and leadership styles are key topics in decisions making in a variety of organizations. According to Anderson (2017), "school systems have begun to function like business organizations with management complexities and the requirement of

bottom-line results" (p. 1). The author continued referencing the call for exceptional school leadership to facilitate needed school change (Anderson, 2017). In evaluating a technical college curriculum, it was important to examine various leadership theories as a conceptual framework. The following section examines three leadership theories, transformational, servant, and instructional; and how they are fashioned in the educational system.

**Transformational leadership.** According to Bass (1985), as cited in Bolkan and Goodboy (2010), "transformational leadership combines qualities including charisma, individualized consideration, and intellectual stimulation" (p. 92), and it is these attributes, as cited by Denmark (2012) that empowered followers to change then-current methods and practices that aligned with organizational goal attainment. In the educational realm, transformational leaders generated spontaneity in faculty and staff. They impressed innovation, collaboration, and the doingness of others to build camaraderie and teamwork. Fitzgerald and Schutte (2010) agreed, "This motivational leadership style involves presenting a clear organizational vision and inspiring employees to work towards this vision through establishing connections with employees, understanding employees' needs, and helping employees reach their potential, contributes to good outcomes for an organization" (p. 495).

Based on research, it is possible that educational leaders following this philosophy may demonstrate a higher level of organizational effectiveness and increased student outcomes, based on the teacher's willingness to adapt and welcome change. According to Camps and Rodríguez (2011), members of organizations or followers led by transformational leaders were persuaded to go above and beyond predefined objectives

moving towards achieving stretch targets. In industry, particularly where data determined growth and success, transformational leaders would seem more effective and productive; but, according to research cited in Camps and Rodríguez (2011), there was no conclusive evidence that this leadership style directly contributed to individual and organization performance. Ozaralli (2003) disagreed with Camps and Rodríguez (2011) and cited Bass and Avolio's (1993) findings which concluded "transformation leadership is positively related to employee satisfaction and to those in-role behaviors which constitute job performance" (p. 335).

Corporate bottom-lines and performance reports spoke to the success or needed improvements in organization. This held true in the school systems student outcomes; state assessments, and district reviews, which addressed the success of leaders. Anderson (2017) stated:

> positive impact on teacher commitment, performance, job satisfaction, and other areas that facilitate overall school success correlates to employee performance, motivation, and job satisfaction in business organizations, transformational leadership style seems to be a viable approach for education leaders to test in transforming schools to meet new stakeholder demands. (p. 3)

It is imperative educational leadership understood the positive impact transformational leaders may have on meeting the needs of the student body. Administration with a transformational leadership style may be more in tune with modifying traditional instructional formats to problem-based learning formats that are more aligned with student needs.

**Servant leadership**. Transformational leadership appeared to rank high regarding motivation and persuasion to follow the ideas and direction of the leaders, on the contrary; the servant leadership model expressed characteristics regarding service to the followers. Letizia (2014) defined servant leadership as "one who leads by serving, by making the wellbeing of his or her follower's first priority" (p. 175). Focusing on the needs of stakeholders in an educational system would visually articulate principals or other educational leaders attending to the needs of teachers, students, parents, staff, and other stakeholder in a school system. The leader listened to the needs of the internal community setting aside personal interest and goals that would afford awards or acclamation on his or her behalf for organizational measures met. According to Rivkin, Diestel, and Schmidt, (2014), "Servant leaders do not lead for their own or their organization's benefit, but for the benefit of multiple stakeholders, and especially their employees" (p. 55). By the same token, Zhang, Lin, and Suan, (2012) stated, "The primary reason leaders exist is to serve first, not to lead first" (p. 370). Additionally, the authors stated, "The servant leader operates on the assumption that "I am the leader, therefore I serve" rather than "I am the leader, therefore I lead" (p. 370). In a school setting, the servant leadership model could "make a profound difference on the impact of learning and the learning experience of both teacher and student" (Hays, 2008, p. 113). This model could encourage self-direction, innovation, and motivation of not only teachers, but students to take the lead in learning. In many educational systems, leaders take on an authoritative style, which could cause resentment and a dependent mentality. Additionally, Hays (2008) stated:

> continuing to teach in ways that replicate command and control, hierarchy, disparities that promote dependence, compliance, and passivity rather than autonomy are antithetical and counterproductive in a time where flexibility, initiative, responsibility, ownership, self-direction, creativity, empowerment and teamwork and collaboration are more essential than ever. (p. 113)

Although this may be true, Palumbo (2016) stated servant leadership may deprive the autonomy of followers by releasing their abilities and overall commitment to achieving organizational goals. In addition, Palumbo (2016) believed the "servant style of leadership brought about a situation of dependency of the followers on the leader rather than the empowerment of the followers" (p. 93). This would conclude the reliance on the servant leader was substantially higher regarding organizational challenges as they arise. It is questionable if the servant leadership model could sustain the 21st century school system. With the increased onset of classroom management challenges, faculty and staff attrition, and economic pitfalls that weigh heavy on school resources it would be interesting to imagine the longevity a school leader would have following this model. According to Insley, Iaeger, Ekinci and Sakiz (2016), their study on servant leaders within a school environment was not aligned with the characteristics of this model. They stated, principals as a servant leader were not sufficient, especially in social relationships, communication, empathy, and modesty. This model would not fare well in the technical college environment. Students were tasked with being self-directed technicians seeking out resolutions to situational challenges. Administration following this leadership style would hamper the attributes offered in a technical college environment, causing students to become more dependent and less self-led.

**Instructional leadership**. Regarding the characteristics qualifying the servant leadership model, and the areas found to be non-compliant for principals, the instructional leadership model would seem more sufficient in achieving the stated organizational goals. Hallinger (2003) stated "instructional leadership has risen as a powerful leadership model which fosters school improvement" (p. 335). Furthermore, Hallinger (2003) continued and stated "it focuses on vision setting and pedagogy to improve student achievement and directly targets teacher professional learning linked to school vision, as well as tracking and evaluation of student achievement" (p. 35).

According to Bendikson, Robinson, and Hattie (2012), leaders following the model of the instructional leader's theory had a stronger impact on student results over the other leadership models. Additionally, the authors cited Robinson, Lloyd, and Rowe (2008) stating, "The more focused the school's leadership is on instruction, the more effective the school will be in adding value to student outcomes" (p. 3).

There were several aspects to instructional leadership that worked best, depending on the level of educational instruction. Educational leaders tasked with leading K-12 schools may exhibit more of a direct instructional leadership model. According to Bendikson et al. (2012), "Direct instructional leadership is focused on the qualities of teacher practice itself. Whereas indirect instructional leadership creates the conditions for good teaching" (p. 3). The authors dissected the instructional leadership traits to reflect their behavior for effectiveness and to add desirable student outcomes. Direct instructional leadership style coincided with leading in more primary levels, where indirect instructional leadership aligned with the high school platform. There were many ideas and prototypes describing instructional leadership and positioning in the

educational realm. According to Horng and Loeb (2010), "a different view of instructional leadership emphasizes organizational management for instructional improvement rather than day-to-day teaching and learning" (p. 66). The authors went on to say, day-to-day observations of classrooms were good, but school leadership's best method to effect student outcome was in the selection of teachers, their assignments, the offering of professional development, and teacher retention (Horng & Loeb, 2010). Authors, Ismail, Don, Husin, and Khalidhor (2018) agreed citing Ako (2008):

> instructional leadership is very closely related to the role and duty of a school principal such as developing and disseminating school aims, setting targeted standards, coordinating curriculum, supervising and evaluating teachers' classroom instructions, encouraging students to study and increasing teachers' and administration staff professional development. (p. 131)

The authors also stated, the best way a school leader could achieve good student outcomes was to ensure all the stake holders were aware of the institution's mission and leadership to pinpoint areas for improvement (Ismail, Don, Husin, & Khalidhor, 2018).

Based on research, there were numerous ways to clarify and define leadership and what style fits best in an organization. The research presented in this writing provides a visual of the complex, yet vital importance of strong leadership. In many organizations, leadership selection was determined by factors aligning organizational missions and objectives, audience, and proposed goals. It was to the better judgement educational entities understood what was best for faculty, staff, and other stakeholders to ensure student outcomes were met. As stated above, the instructional leadership style seemed to concur with the climate required for meeting educational demands. Overall, it was with

strong emotion to side with researchers in agreeing the instructional leadership traits would offer more in meeting annual educational measurements. In the same fashion, as with the K-12 learning model, instructional leadership styles would seem to fit the climate of career technical institutions. Leaders which exhibit instructional leadership traits in career technical education must support teachers and inspire students to achieve their goals. This could be completed by aligning relatable curriculum and instruction that prepared college and career ready students for the 21st century (Kappler & Long, 2017). Curriculum that seemed suitable for career technical institutions and were more in line with tactile learning environments would be problem-based learning formats.

**Problem-Based Learning**

Historically, traditional teacher-centered methods of facilitation were the model for educational instruction and continued to maturate through post-secondary facilitation in all directions. For adult learners who were, for the most part, self-directed students and decided to embark on new skills and knowledge, is this the right path? These self-directed traits that characterized adult learners stemmed from the innate need to achieve personal goals to obtain self-satisfaction (Tough, 1971).

Educational communities must be cognitive in understanding many adult learners were well informed and self-directed in nature to the need for additional learning and did not need hand holding. A learning format conducive for adult learners where the teacher-centered reigns were passed to the students was Problem-Based Learning. According to Yeo (2005), “Problem based learning requires instructors to re-examine his/her role as content expert and reconsider the delivery power taking place in the classroom” (p. 99). Adults entered the classroom with lived experiences. Some were more informed than

others regarding the information they were seeking, and the systematic process needed to acquire it. Problems or a 'state of difficulty' was the breast milk of adulthood.

PBL allowed students the autonomy to learn by doing with the guidance of the facilitator. Yeo (2013) further stated this design empowered the learner to raise questions, challenging facilitators on existing issues to the problem at hand. It is this method of instruction that best met the career technical students' needs.

Research stated the PBL format was built on the foundations of the Constructivist Learning Design Model by Jonassen (1999). Gudduz et al. (2016) stated PBL embedded the elements of knowledge being construed by the interaction with the environment, learners being motivated by cognitive conflicts, knowledge being improved by discussion, and knowledge being constructed by leaners (p. 50). Steiner (2014) concurred, stating, "Constructivist theories of learning are based upon the premise that learners construct meanings in their minds and integrate new knowledge into their mental constructs" (p. 319). Steiner (2014) continued, stating, "Constructivists speak of 'learning by doing,' encouraging children to 'be the authors of their own knowing'" (p. 319). This approach was considered the preferred method of teaching. According to Steiner (2014), "In the United States and elsewhere, constructivism is taught on a large scale to student teachers in schools of education as the preferred method for teaching" (p. 319). These elements were the components threaded into the PBL format respecting the adult learner's innate ability, experience, and zest for new information.

PBL was the holistic approach to problem solving in the classroom. Students were assigned a problem, grouped to collaborate ideas, required to define its origin, and assigned problem resolution using available knowledge (Jindal, Mahajan, Srivasav, &

Baro, 2016). Merritt, Mi Yeon Lee, Rillero, and Kinach, (2017) stated this "systematic method of instruction settled on the shores of McMaster University's medical school in 1970" (p. 14). Barrell (2007), as cited in Gudduz et al. (2016), "defines problem-based learning as a process of investigation in which the student tries to solve curiosities, doubts, uncertainties, and problems in real life context" (p. 49). Jindal, Mahajan, Srivasav, and Baro (2016) claimed "problem-based learning instills problem solving skills, argumentation rules, collaboration, and peer tutoring" (p. 77). These authors also stated, this method of instruction was "an instructional (and curriculum) learner-centered approach that empowers learners to conduct research, integrate theory and; practice and apply knowledge and skills to develop a viable solution to a defined problem" (Jindal et al., 2016, p. 77).

"PBL is widely used in various disciplines since it is claimed to improve students' soft skills" (Kadir et al., 2016, p. 166). These qualities and skills were the characteristics sought by workforce. As seen in a survey conducted by Manpower Group in 2012, results found many employers are not satisfied with their current employee's problem-solving skills" (as cited in Kadir et al., 2016, p. 166). The authors continued citing a survey by Grant Thornton LLP (2010) "finding fifty-five percent of employers claimed recruiting accounting executives with necessary soft skills such as communication, critical thinking, and problem-solving abilities poses the most significant challenges" (p. 166). These challenges led to the scrutiny on traditional teacher-centered instructional delivery format at tertiary educational levels (Kadir et al., 2016).

The makeup of a PBL curriculum began with the problem context. These problems or situational challenges related to social, cultural, and usually a physical

structure outlining the premise for technical discovery in career technical programs and aligned with then-current practice in technical courses. Lysne and Miller (2017) agreed that active instructional environments showed to be more engaging for students creating greater academic achievement. Research stated, "Learner engagement can be manifested in the development of critical thinking skills, higher grades and a general embracing of learning by taking responsibility and actions to achieve intrinsically motivated goals" (O'Shea et al., 2015, p. 43). Overall, problem-based learning environments were the causal agent for the active learning approach. Problem-based learning activities caused students to be engaged in study and retain content, based on the continuous feedback received doing the social interaction.

**Active Learning Approach**

The active learning approach stated, "Active instructional approaches have been championed by organizations (American Association for the Advancement of Science [AAAS], 2011) and Dehann (2005) as a better alternative to more traditional approaches of instruction that rely heavily on exposition or lecture" (as cited in Lysne & Miller, 2017, p. 100). Furthermore, active learning formats were proven to be more engaging stimulating a higher-order thinking and critical analysis. This model increased the learner's ability to interact with others utilizing soft skills, collaborations, and group discussion (Lysne & Miller, 2017). The active learning model supported the notion that individuals learned best upon building their own knowledge and ideas through experiences, and these experiences were best gained in active learning environments. Problem-based learning format offered the best platform for this model. These essential characteristics of problem-based learning "directs students towards the identification and

application of research concepts and information, encouraging them to work collectively and communicate effectively" (Jindal et al., 2016, p. 77). According to Chan (2016), the "relationship of learning and teaching approaches over the past 30 years have provided us with better insights on how learners learn" (p. 25). Chan (2016) referenced two types of learning based on Marton and Saljo's (1976), "deep and surface" learning. . . Depending on their perceived purpose of the learning task, some students adopt a deep approach, and some adopt a surface approach" (p. 25). It was important for teachers to know their audience to align learning objectives. Chan (2016) stated, "it is not just students' innate attributes, but the way they choose to study that counts: this is a part of student-centered learning" (p. 25).

PBL is a method of instruction which exemplified the 'deep learning' approach by identifying real-life circumstances which are the catalysis and the stimulus for student-centered activities (Chan, 2016). It is these activities, which created the active instructional approach embedded in the PBL model.

**Motivation, Engagement, and Academic Achievement**

Motivation was one facet of the problem-based learning model. It was very important to consider the audience and catalyst required for student engagement. According to Koshkin, Abramov, Rozhina, and Novikov (2018), "it is extremely important to determine relevant social factors majorly impacting the students' representation about further education and its role in building and shaping up the motivation to continue education" (p. 313). Moreover, students were more likely to succeed in the content area if they were motivated and the information could provide a more informed decision. O'Conner (2018) agreed,

> As teachers, we understand the importance of engaging our students. Researchers agree that motivation to learn is one of the most important indicators of student success, regardless of age. An interested student will give the learning task extra attention and is more likely to retain what he or she has learned. In short, an engaged student will learn more than a disengaged learner. (p. 56)

Once students were engaged and motivated, academic achievement would follow.

Students who met educational goals and objectives acquired the status of academic achievement. Instructional formats and the academic achievement of students paralleled greatly. There was a pressing need to provide effective instruction for struggling adolescents and adults; and could be a limiting factor for educational success (Calhoon, Lehigh, Scarborough, & Miller, 2013, p. 489). Institutions of Higher Learning must be open to creating instructional platforms, which include learning environments welcoming for the adult learner. Adult learners were more academically successful in educational settings when they feel a since of control over the learning process (Knowles et al., 2005). Additionally, adult learners were vested upon entering learning environments that were authentic and purposeful where individual learning goals were created.

**Summary**

Career technical education was a significant piece of the educational platform for decades. Research disclosed the numerous occasions education reform focused on career technical education programs. Moreover, research contended career technical education programs continually altered, based on the uncertainties of the economy, without considering the instructional model. For programs of this nature to be successful, the

learners must be considered. Majority of career technical education programs attracted learners more tactile in nature and less focused on academia. Based on the continuous improvement at the Federal and State levels to include Core Curriculum in career technical education programs, instructional formats must change from a traditional teacher centered model to an active learning format. New curriculum must first be inclusive and forthright about teaching adult learners. Additionally, understanding that adults learn differently than with instruction pedagogical in nature, an active learning approach seemingly would accommodate this audience offering success for the programs and academic achievement for the learners. Chapter Three outlines the methodology used for this study.

# Chapter Three: Research Method and Design

## Purpose

The aim of this mixed-method study was to investigate the relationship between the problem-based learning model, self -directedness, engagement, motivation (as measured by the Motivational and Attitudinal scale), and academic achievement of Midwest technical students enrolled in general studies courses, by comparing the traditional instructional format to a piloted problem-based learning format. As stated by Fraenkel, Wallen, and Hyun (2015), a mixed methods study allows the researcher the use of both quantitative and qualitative data to clarify, confirm, and explore possible relationships among two or more variables.

The researcher used the triangulation approach, which allowed for deeper understanding and validation of comparative findings from different perspectives. Moreover, triangulation conjugated data to promote rigor, developing a deeper meaning of the information and realizing a complete picture of the topic under inquiry (Brown et al., 2015, p. 194). Triangulation reduces bias and increases confirmation of the hypotheses (Kuorikoski & Marchionni (2016). Further, according to Fraenkel et al. (2015), validity is enhanced when the method of data collection is supported using multiple instruments or triangulation. Analyzing qualitative and quantitative data gave rise to faculty and students' thoughts, perceptions, and understanding of PBL in contrast to traditional methods of instruction. The intended purpose for the study was to identify if tactile learners, who then-currently spent 75% of their program in hands on instructional courses would benefit from the implementation of a PBL format in general studies courses. Creating an academic learning platform that mimicked technical

instruction where students solved real life problems would encourage students to take active roles in learning. This study may determine if the PBL model in general studies courses created a change in learning for technical students.

**Research Method**

The quantitative findings enabled the researcher to compare student summative assessment scores generated before problem-based learning was implemented from spring 2016-2017, summer 2016-2017, and fall 2017-2018 to spring 2017-2018, summer 2017-2018 and fall 2018-2019 academic years, to scores generated after problem-based learning was implemented and then to determine if there were any changes in technical students' assessment scores. In addition, this type of study provided the researcher with insight on student's instructional preference for learning new content in general studies courses noting if students' levels of motivation, engagement, and self-directedness changed once the problem-based model was introduced. Finally, the quantitative study led the researcher to analyze institutional end-of-course survey results to compare if changes to the instructional format reflected possible shifts in student perception and willingness to engage in general studies courses. The qualitative facet of this study brought forth feedback from general studies' facilitators regarding their prescribed pedagogical preference of instruction, methods for student engagement and motivations, and insight proportional to the problem-based learning curriculum. Boeren (2018) claimed qualitative research methods originated from inquiries tending to be more 'open, allowing for more ideas to come forth during the data collection process. The researcher anticipated through faculty feedback, additional insight could be gained regarding traditional pedagogical formats, perception, and knowledge of problem-based learning;

and then-current methods and techniques used for motivating and engaging students, in addition to offerings of self-directedness and knowledge retention in traditional learning formats.

There were several researchers who studied problem-based learning in relationship to adult learners; however, no studies integrating problem-based learning formats into general studies courses at career technical education or vocational institutions were found. Notably, a study by Willis (2002) examined the design, implementation, and assessment of PBL in a general psychology course, however, limited information specific to tactile students' kinesthetic nature utilizing PBL as the learning platform for general studies courses remained in infancy. The research questions and hypothesis were as follows:

**Research Questions and Hypotheses**

**Research Question 1:** Which PBL activities helped students comprehend the subject content?

**Research Question 2:** What facilitation methods used by teachers align with the problem-based learning model and the traditional model?

**Research Question 3:** What are faculty's perceptions of the problem-based learning model in general education courses in a technical college in relationship to student motivation, academic achievement, engagement and self-directedness.

**Research Question 4:** What are students' perceptions of problem-based learning vs. traditional models?

**Null Hypothesis 1:** There will be no difference in end-of-course evaluations and summative (final) assessment scores between the traditional learning model and PBL model.

**Null Hypothesis 2:** There will be no difference between self-directedness in the problem-based learning model vs. the traditional model.

**Data Analysis**

The responses gathered from student interviews and the faculty focus group were coded and analyzed. The researcher grouped the participants' responses and aligned the responses to problem-based learning activities and Knowles' Six-Assumptions. Based on questions asked, participant responses expressing classroom activities that required students to collaborate course material were coded under, "Group/Chat Room Discussion." Course assignments requiring content research and cognitive reasoning aligned with "Case Study/ Research Assignments," and finally, assignments requiring students to collaboratively contribute individual work aligned to "Group Projects." In addition, these categories were paralleled to the characteristics of the Six Assumptions of Adult Learners:

1. Concept of the learner- Adult learners need to know why they need to learn something new. Institutions must take this into account when designing curriculum
2. Role of the learner's experiences-Adult learners are responsible for their own decisions and learning. Faculty must consider creating class activities that will incorporate life experiences. This can be a valuable resource.

3. Readiness to learn, aligning learning with development- Adults learning needs must be addressed early in the learning continuum to ensure success of the learner.

4. Orientation to learning-Adult learners tend to be motivated to learn. Curriculum should be process based versus content based.

5. Motivation to learn- There is an intrinsic value for the adult learner as a personal payoff.

6. Adults need to know-Adult learners need to know why they need to learn something. This included all external and internal gains including negative implications for information not learned. (Knowles, 1984, p. 9)

Research question number 1, Qualitative Coding Analysis is indicated in Table 3.

Table 3

*Qualitative Coding Analysis for RQ1*

| RQ1. Which PBL activities helped students comprehend the subject content? | | |
|---|---|---|
| Code | Definition of Code | Six Assumptions |
| Group/Chat Room Discussion | Student working in small groups discussing daily objectives and material content. | Self-concept of the learner |
| Case Study /Research Assignments | Students receive prompts to research aligning course content. Critical evaluation report presentation. | Self-concept of the learner |
| Group Projects | Collaboration of ideas based on course content, problem resolution. | Orientation to learning-Problem Centered |

In addition, Table 4 displays qualitative coding for research question two and how facilitation methods used by instructors were grouped and analyzed. This included

teacher-centered lectures or traditional learning, which was defined by instructors facilitating course content they deemed prudent and valuable for content mastery and student success. This instructional method excluded acknowledgement of students' personal offerings of course content, based on prior knowledge. This method of dissemination was solely based on the facilitator's collection of subject-matter information and content expertise.

Table 4

*Qualitative Coding Analysis for RQ2*

RQ2: What facilitation methods used by teachers align with the problem-based learning model and the traditional model?

| Code | Definition of Code | Six Assumptions |
|---|---|---|
| Teacher-Center Lectures (Traditional) | Teacher consider expert, gathers course information and creates outlines and learning objectives | Not Applicable Pedagogical approach |
| Formative /Summative Assessments (Traditional) | Students are assessed over course content | Not Applicable Pedagogical approach |
| Case Study /Research Assignments (PBL) | Students are provided with content prompt to research and investigate | Self- concept of the learner |
| Group Projects (PBL) | Students working in unison to produce information or findings | Orientation to learning - Problem Centered |

Similarly, Table 5 displays qualitative coding for research question three and the assembly of feedback relative to faculty's conceptualization of the problem-based learning method in general studies courses in the areas of motivation, academic achievement, engagement and self-directedness. The responses were aligned to the Six

Assumptions of Adult Leaners to display faculty's knowledge and understanding of the PBL model.

Table 5

*Qualitative Coding Analysis for RQ3*

RQ3: What are faculty's perceptions of the problem-based learning model in general education courses in a technical college in relationship to student:

a. Motivation

b. Academic achievement

c. Engagement

d. Self-directedness

| Code | Definition of Code | Six Assumptions of Adult Learners |
|---|---|---|
| Motivation | Student interest giving learning context high attention | Self-concept of the learner |
| Academic Achievement | Student achievement of academic or stated goals | Orientation to learning - Problem Centered |
| Engagement | Student doingness or act of participating in stated activities | Role of the learner's experience |
| Self-directedness | Student in innately motivated, can self-regulate without instruction | Motivations to learn |

Similarly, Table 6 displays qualitative coding for research question four and the assembly of feedback relative to student's conceptualization of the problem-based learning model compared to the traditional model. These responses were not applicable to the Six Assumptions of Adult Learners.

Table 6

*Qualitative Coding Analysis for RQ4*

RQ4: What are students' perceptions of problem-based learning vs. traditional models?

| Code | Definition of Code | Six Assumptions |
|---|---|---|
| Perception (PBL) | Prior knowledge, Familiarity with instruction | Not Applicable |
| Perception (Traditional) | Prior knowledge, familiarity with instruction | Not Applicable |

**Null Hypotheses**

Null Hypothesis 1: There will be no difference in end-of-course evaluations and summative (final) assessment scores between the traditional learning model and PBL model.

**End-of-course Institutional Surveys**. To answer hypothesis 1, the researcher compared students' end-of-course institutional survey responses and summative (final) assessments scores of technical students enrolled in Psychology/Sociology from the 2016-2017, 2017-2018, and fall 2018 semesters, before and after implementing the PBL learning model. Based on the fluctuation of Sociology instructors within the stated semesters, the researcher used 68 survey data and assessments scores only from the Psychology courses, as the facilitators in both ground (seated) and online sections were consistent throughout all semesters. At the end of each semester, the institution requested student feedback. This information was collected through a four-point Likert scale survey, with 1 being strongly disagree and 4 strongly agree. Students enrolled in technical and general studies offerings were asked to complete the survey. The survey

consisted of 10 questions centered on course objectives, instructor knowledge, and classroom management. Institutional administration created the questions to align with the institution's mission and the strategic planning model. The questions were as follows:

1. The lesson objectives and outcomes of this online course were clearly communicated by the instructor.
2. The syllabus and/or information provided on Inside Ranken was consistent and current, written clearly, and provided me with a good guide for planning ahead in the course.
3. The online learning activities (assignments, tests, projects, collaboration, etc.) for the course helped me meet the course objectives.
4. It was clear to me that the instructor was knowledgeable about the subject matter.
5. The instructor was available to help me if I had questions or needed extra help.
6. The instructor adequately facilitated online discussion between students enrolled in class.
7. Interaction with other students via online collaboration was helpful in meeting learning goals.
8. Assignments were graded in a timely manner and I received feedback which was helpful.
9. Technical support for this course was readily available and helpful.
10. The textbook and/or other required coarse materials were used throughout the course and were helpful in learning the objectives and outcomes of the course.

**Summative Assessments**

Additionally, at the end of each course, students were evaluated over course content mastery through a summative assessment. These assessments were derived from elements included in the institutional program outcomes and course level outcomes. All general study courses aligned to five institutional program outcomes. From the program outcomes, individual course level outcomes were created to assess students' knowledge and application of course material studied. Facilitators collaboratively created an exam encompassing overall course material to assess content mastery and application. The number of questions were dependent upon information facilitators deemed reasonable to assess and stated course level outcomes. To answer the null hypothesis, the researcher obtained 185 summative assessment scores from the school's administration of psychology, comparing before and after the problem-based learning model was implemented.

**Null Hypothesis 2:** There will be no difference between self-directedness in the problem-based learning model vs. the traditional model.

**Self-directed Scale Survey**

To answer null hypotheses two, the researcher developed the research instrument from a published survey created by Beres (2011), who was contacted via email and who approved the adaption and minimal modification of survey questions replacing 'Math' for 'Psychology/Sociology' (see Appendix D). For students completing the survey, an informed consent was provided. The researcher expected a minimum of 50 completed self-directed scaled surveys via *Qualtrics,* a web-based survey tool from students enrolled in seated and online Psychology/Sociology courses from the fall 2016-2017, spring 2016-

2017 and summer 2016-2017. In addition, students from fall 2017-2018, spring 2017-2018, summer 2017-2018, and fall 2018 courses were contacted to participate. At the bottom of the self-directed scaled survey, participants were asked to leave contact information (email and phone number), if they were interested in participating in a 45-minute interview regarding problem-based learning. The survey was emailed to 200 psychology students from the 2016-2017 fall semester, 2016-2017 spring semester, 2016-2017 summer semester, 2017-2018 fall semester, 2017-2018 spring semester, 2017-2018 summer semester, and 2018 fall semester. After several months of waiting, only two students responded to the survey. The researcher made two additional attempts to reach previous students enrolled in social science courses during that period. The researcher concluded one possible challenge could have been the inaccessibility of 2016-2017 students to retrieve emails upon graduation. The institution allowed graduate students access to emails up to one year after graduation. This may have contributed to the low response rate in addition to the lack of interest in completing surveys via email regarding general studies courses without incentives. The researcher also considered the method used to reach past and present technical students may not have been the best method to recruit participants. Upon these conclusions, the researcher met with the social science department and expressed the low number of participants. The facilitators decided to offer classroom incentives to reach minimal participation. These incentives included an additional five points for the lowest formative exam or the deletion of one discussion board posting which was worth five points. This decision increased student responses to 34. Of the 34 survey respondents, five students agreed to participate in the 45-minute student interview of which two were successful. The research assistant (dissertation

chairperson) contacted the participants and conducted the interviews by phone. A total of 34 students participated in the Self-directed Scale Survey.

To align the Self-Directed Scale Survey responses to Null Hypothesis 2, questions Q1, Q2, Q4, Q5, Q8, Q11, Q13, Q15, Q18, and Q19 were included in a composite score. Overall, these questions offered direction toward self-directedness, motivation, and engagement of the student. Questions Q3, Q6, Q7, Q9, Q10, Q12, Q14, Q16, and Q17 were geared towards the internalized emotions and feelings of students in psychology and sociology class. The researcher determined the study could have included an additional null hypothesis that offered insight to students' feelings and internalizations while enrolled in general studies courses.

**Research Questions**

**Focus group**. To answer the research questions, general studies facilitators' perceptions, instructional preference, knowledge, and willingness to explore problem-based learning formats were collected using a focus group discussion. Upon approval from the Institutional Review Board of Lindenwood University, as well as permission to use the Midwest Technical College as the study site (see Appendix E), college faculty facilitating general studies courses were asked to participate in a voluntary focus group answering six questions (see Appendix A). All general studies facilitators (32) were sent an email via the institution's email system, by the researcher, inviting them to participate in a focus group. The researcher was the department chairperson of general studies at Midwest Technical College and had access to faculty emails. To remove all biases, the researcher enlisted the assistance of her Dissertation Chairperson to perform qualitative data gathering activities and qualifying the data collection process. Interested faculty

were asked to reply within a week of the initial email. Upon acceptance, faculty received a consent form via the institution email system and asked to sign and return within a week to the researcher's interoffice mailing system. Upon acquiring the minimal number for a focus group, faculty were provided the location and date. According to Fraenkel et al. (2015), "In qualitative studies, the number of participants in a sample is usually somewhere between 1 and 20" (p. 104).

Out of the 32-faculty inquiry, 10-general studies faculty agreed to meet with the research assistant for approximately 90 minutes. The focus group took place at the Midwest Technical College in room G100 (main conference room) during lunch when a majority of faculty were available. The data collected were audio-recorded for transcription. Additionally, general psychology and sociology instructors provided additional feedback regarding students' behaviors in both instructional formats, which included online and ground (seated) classes. The researcher conducted in-class observations during seated sections of the 2016-2017, 2017-2018, and 2018 fall semester of psychology. These observations were based on classroom disruptions, unfavorable student reports, and the facilitator's call for assistance. To understand if the class challenges were isolated in nature, the researcher observed several seated sections of sociology during the same semester, taking note of student behavior, classroom engagement, and possible issues with instruction. These intermitting observations continued through the end of the school year.

Additionally, the researcher asked technical students to participate in a voluntary interview answering 10-questions (see Appendix B) reflecting on their experiences, instructional activities, and instructional preference related to general studies courses.

**Interviews**. To answer the research questions, of the five technical students that agreed to participate in a 45-minute interview, two students contacted the research assistant via email expressing interest in participating and then completed the interview. The research assistant asked each student 10 questions. The data collected were audio-recorded for transcription. These three instruments provided assurance that the assumptions were based on data collected and data analyzed.

**Validity and Reliability**

The need to include multiple instruments in this mixed method study weighs heavily on the validity and reliability of the instruments used. In Fraenkel et al. (2015), it was the quality of instruments researchers used to guide conclusions or affirm assumptions based on data collected. In addition, it was the series of procedures to ensure that the conclusion was referenced in the data collected. The self-directed scale survey provided the researcher with a sound and reliable instrument for collecting data regarding technical students' engagement and motivation in general psychology/ sociology courses (Beres, 2011). This survey was validated and reviewed by subject matter experts constituting a valid and reliable instrument. By the same token, the use of secondary data gathered from summative assessment scores and end-of-course surveys, before and after the implementation of problem-based learning provided insight and feedback, which contoured explanations, which aligned to hypotheses one and two.

As of equal importance, the researcher used student interview data and faculty focus group feedback as a cross verification to strengthen the research findings. This example of triangulation ensured reliable answers, where potential bias could birth query and ensured deeper understanding of data gathered. This practice strengthened the data

collection process, bringing confidence in the findings (Lawlor, Tilling, & Davey-Smith, 2016). Overall, the use of a systematic process promoting methods of validity and reliability increased the transferability and truthfulness of the research study.

**Limitations**

Triangulation, as stated previously strengthened research findings promoting validity and the reliability of the study; however, there were limitations in the study. Several obstacles arose in locating participants for student interviews. Based on the voluntary option to participate in the interview without additional incentives reduced students' participation number to two. Additionally, the researcher only included one career technical education/vocational institution in the study, which placed limitations on the data collection process. Furthermore, regarding students' minimal response to surveys, emails were sent via the institution email portal during summer session. This may have limited responses, based on the then-current institutional challenges of technical students not taking the initiative to check emails sent via the institutional email system, students on summer, break and millennials and Gen Z not favoring traditional email communication, but newer forms of communication, Instagram, and Snapchat, etc.

**Summary**

This study was piloted at a Midwestern technical college, based on unfavorable observations noted in social science (psychology and sociology) courses, which were part of the general studies curriculum. The researcher implemented PBL activities to investigate in a seated psychology course to determine if the inclusion of PBL was connected to possible changes in student motivation and engagement, self-directedness, and the academic achievement of technical students enrolled in general studies courses.

A mixed-method approach was used to gain insight from general studies faculty on their perceptions, instructional preferences, knowledge regarding PBL, and then-current student engagement methods used in the classroom. Technical students provided information regarding perceptions of general studies courses, course activities, and traditional prescriptions for engagement. This type of method allowed the comparable examination of the piloted PBL format to the traditional instructional format in two general studies courses. Student feedback gave way to perceptual experiences before and after PBL implementation, and lack thereof, regarding self-directed and motivational incentives in general studies courses. Chapter Four explains the results attained from this mixed-methods study.

# Chapter Four: Analysis

## Introduction

The analysis in Chapter Four investigates the relationship between the problem-based learning model, academic achievement, self-directedness, and the motivation and engagement of Midwest technical students enrolled in general studies courses. Additionally, the research compared the traditional learning model to the problem-based learning model, using institutional end-of-course surveys and student summative assessment scores. The researcher used a mixed method approach, employing a four-point Likert scale student survey, faculty focus group, teacher observations, student interviews, institutional end-of-course survey results, and the summative assessment scores of students enrolled in psychology and sociology courses during fall, spring, and summer semesters of 2016 through fall semester of 2018. Chapter Four is divided into two primary sections, quantitative analysis and qualitative analysis; these sections explain the statistical results and the findings from the research conducted during the faculty focus group and student interviews.

## Quantitative Analysis

**Null Hypothesis 1**. The researcher analyzed student survey responses to investigate if there was a difference between the problem-based learning format and the traditional learning format. A total of 68 student end-of-course surveys and 173 student summative assessment scores were analyzed in the study. Of the 173 summative assessment scores, 44 were documented before the implementation of problem-based learning in the fall and spring semesters of 2016-2017, and 129 summative assessment scores were documented after the implementation of problem-based learning from fall

semester of 2017-2018 and fall semester of the 2018-2019 academic year. Out of the 12 questions presented in the institutional end-of-course survey, five questions aligned with Null Hypothesis 1. The remaining seven questions aligned with the instructor's teaching ability, undertaking of classroom management and readiness, textbook selection, and use of classroom technology. The researcher conducted a series of *t*-tests of two independent samples to determine if the results from the institutional surveys were different before and after PBL implementation. The researcher ran a test for each of the five questions related to Null Hypothesis 1.

**Null Hypothesis 1**: There will be no difference in end-of-course evaluations and summative (final) assessment scores between the traditional learning model and PBL model. The end-of-course survey Question (A) stated, 'the learning objectives and outcomes of the course were regularly explained by the instructor.' For the Fall 2016-2017 semester, 11 students agreed, five students strongly agreed, four disagreed, and five strongly disagreed, out of the 25 responses to which the course information was regularly explained. Fall 2017-2018, five students agreed, three students strongly agreed, five disagreed, and seven students strongly disagreed, out of 20 responses, and for spring 2017-2018, seven students agreed and eight strongly agreed, five students disagreed, and three students strongly disagreed, out of 23 responses. Additionally, a preliminary test of the variances revealed they were equal. The analysis revealed that the responses to Question (A) after PBL was implemented (M = 3.48, SD = 0.51) were not significantly different from those before PBL was implemented (M = 3.27, SD = 0.46); $t(36) = 1.30$, $p = .202$. Therefore, the researcher failed to reject the null hypothesis and concluded that

for Question (A), the end-of-course survey responses after PBL was implemented were not significantly different from those before PBL was implemented.

Question (B) asked 'if the learning activities (lectures, assignments, tests, projects, etc.) for the course helped me meet the objectives.' Fall 2016-2017 semester, 13 students agreed, eight strongly agreed, three disagreed, and one strongly disagreed, out of the 25 responses, the learning activities helped the student meet the course objectives. Fall 2017-2018 semester, eight students agreed, three strongly agreed, five disagreed, and four strongly disagreed, out of 20 responses. For Spring 2017-2018, seven students agreed, eight strongly agreed, five disagreed, and three strongly disagreed, out of 23 responses. For Question (B), related to the objectives, a preliminary test of variances revealed that the variances were equal. The analysis revealed that the responses to Question (B) after PBL was implemented ($M = 3.45$, $SD = 0.51$) were not significantly different from those before PBL was implemented ($M = 3.32$, $SD = 0.48$); $t(37) = .85$, $p = .402$. Therefore, the researcher failed to reject the null hypothesis and concluded that for Question (B), the end-of-course survey responses after PBL was implemented were not significantly different from those before PBL was implemented.

Question (C) asked if 'assignments were graded in a timely manner and I received feedback in which was helpful.' Fall 2016-2017, 15 students agreed, five strongly agreed, and no students disagreed, out of the 25 responses, that assignments were graded in a timely manner and they received feedback that was helpful. Fall 2017-2018 semester noted eight students agreed, three strongly agreed, five students disagreed, and four strongly disagreed, out of 20 responses, and for spring 2017-2018, 11 students agreed, five students strongly agreed, four students disagreed, and four strongly disagreed, out of

23 responses. For Question (C) related to the objectives, a preliminary test of variances revealed that the variances were equal. The analysis revealed that the responses to Question (C) after PBL was implemented (M = 3.48, SD = 0.51) were not significantly different from those before PBL was implemented (M = 3.27, SD = 0.46); $t(36) = 1.30$, $p = .202$. Therefore, the researcher failed to reject the null hypothesis and concluded that for Question C, the end-of-course survey responses after PBL was implemented were not significantly different from those before PBL was implemented.

Question (D) asked if 'textbook or other required course materials were useful in learning the objectives and outcomes of the course.' Out of 25 responses from fall 2016-2017 semester, 10 students agreed, eight strongly agreed, three disagreed' and four strongly disagreed the textbook or other required course materials were useful in learning the objectives and outcomes of the course. For Fall 2017-2018, seven students agreed, one student strongly agreed, six students disagreed, and three students strongly disagreed, out of 20 responses, and for Spring 2017-2018, seven students agreed, eight students strongly agreed, two disagreed, and three students strongly disagreed, out of 23 responses. Question (D), related to the objectives, a preliminary test of variances revealed the variances were equal. The analysis revealed the responses to Question (D) after PBL was implemented (M = 3.38, SD = 0.49) were not significantly different from those before PBL was implemented (M = 3.44, SD = 0.51); $t(40) = -.0444$, $p = 0.695$. Therefore, the researcher failed to reject the null hypothesis and concluded that for Question (D), the end-of-course survey responses after PBL was implemented were not significantly different from those before PBL was implemented.

Question (E) asked if 'the syllabus and/or information provided on institution learning management system was consistent and current, written clearly, and provided me with a good guide for planning ahead in the course?' Three students disagreed, and three students strongly disagreed. For the Fall 2017-2018 semester, eight agreed and two strongly agreed, and seven disagreed and three students strongly disagreed, out of 20 respondents. For the Spring 2017-2018 semester, eight students agreed, four strongly agreed, seven disagreed, and four students strongly disagreed, out of 23 respondents, the syllabus and/or information provided on institution learning management system was consistent and then-current, written clearly, and provided a good guide for planning ahead in the course.

Table 7

*End-of-Course Survey Results*

| Institutional Student Survey Questions | Before PBL M(SD) | After PBL M(SD) | t -Score | p-value |
|---|---|---|---|---|
| The learning objectives and outcomes were regularly explained by the instructor. | 3.27(0.46) | 3.48(0.51) | 1.30 | .202 |
| The learning activities (lectures, assignments, tests, projects, etc.) for the course helped me meet the objectives? | 3.45(0.51) | 3.32(0.48) | 0.85 | .402 |
| Were assignments were graded in a timely manner and I received feedback in which was helpful? | 3.48(0.51) | 3.27(0.46) | 1.30 | .202 |
| Were textbooks or other required course materials useful in learning the objectives and outcomes of the course. | 3.38(0.49) | 3.44(0.51) | -.0444 | .695 |
| If the syllabus and/or information provided on Inside Ranken was consistent and current, written clearly, and provided me with a good guide for planning ahead in the course? | 3.27(0.45) | 3.35(0.49) | -0.526 | .601 |

For Question (E), related to the objectives, a preliminary test of variances revealed that the variances were equal. The analysis revealed that the responses to Question (E) after PBL was implemented (M = 3.27, SD = 0.45) were not significantly different from those before PBL was implemented (M = 3.35, SD = 0.49); $t(37) = -0.526$, $p = .601$. Therefore, the researcher failed to reject the null hypothesis and concluded that for Question (E), the end-of-course survey responses after PBL was implemented were not significantly different from those before PBL was implemented. The results of the research conducted are shown in Table 7.

The researcher conducted a *t*-test of two independent means to see if there was a difference in summative assessment scores before and after the implementation of problem-based learning. A preliminary test of variances revealed that the variances were not equal. The analysis revealed that the summative assessment scores after PBL was implemented (M = 82.09, SD = 19.32) were significantly different from those before PBL was implemented (M = 67.05, SD = 8.65); $t(43) = 7.21$, $p < .0001$. Therefore, the researcher rejected the null hypothesis and concluded that the summative assessment scores after PBL was implemented were significantly higher than the summative assessment scores before PBL was implemented.

The researcher conducted additional *t*-tests of independent means to determine if there were differences in summative assessment scores when the same instructor taught both groups, one before PBL was implemented and the other after. There were two instructors who taught classes both before and after PBL. Comparing the summative assessments for Teacher 1, a preliminary test of variances revealed that the variances were not equal. The analysis revealed that the summative assessment scores after PBL

was implemented (M = 82.36, SD = 21.31) were significantly different from those before PBL was implemented (M = 67.57, SD = 8.09); $t(27) = 5.54$, $p < .0001$. Therefore, the researcher rejected the null hypothesis and concluded that for Teacher 1, the summative assessment scores after PBL was implemented were significantly higher than the summative assessment scores before PBL was implemented.

Comparing the summative assessments for Teacher 2, a preliminary test of variances revealed that the variances were equal. The analysis revealed that the summative assessment scores after PBL was implemented (M = 81.52, SD = 14.57) were significantly different from those before PBL was implemented (M = 66.13, SD = 9.76); $t(60) = 3.92$, $p = .0002$. Therefore, the researcher rejected the null hypothesis and concluded that for Teacher 2, the summative assessment scores after PBL was implemented were significantly higher than the summative assessment scores before PBL was implemented. The summative assessment scores results are shown in Table 8.

Table 8
*Summative Assessment Scores*

| | Before PBL M(SD) | After PBL M(SD) | t- Score | p-value |
|---|---|---|---|---|
| Teacher 1 | 67.57 (8.09) | 82.36 (21.31) | 5.54 | <.001 |
| Teacher 2 | 66.13 (9.76) | 81.52 (14.57) | 3.92 | .002 |
| Composite | 670.5 (8.62) | 82.09 (19.32) | 7.21 | <.001 |

**Null Hypothesis 2.** The researcher analyzed the data to investigate if there was a difference between student's self-directedness in the problem-based learning format and the traditional learning format.

**Null Hypothesis 2**: There will be no difference between self-directedness in the problem-based learning model as compared to the traditional learning model.

To analyze if technical students exhibited self-directedness in the traditional learning format or if the implementation of PBL caused students to become self-directed in a general studies class, a *t*-test was conducted. General studies' students enrolled in psychology and sociology class in fall, spring, and summer 2016-2017; fall, spring, and summer 2017-2018, and fall 2018 were sent a link inviting them to participate in a 20-question Likert scale, self-directed survey via the institution's learning management system. Table 9 displays the 11 questions used in the *t*-test of the self-directedness scale survey (the entire survey can be found in Appendix C).

Table 9

*Self-Directedness Scale Survey*

| Survey Questions | M (SD) |
|---|---|
| Q1. I work hard to be successful in psychology/ sociology because I will need to use psychology/sociology in my future. | 2.29 (0.62) |
| Q2. Performing classroom examples help me to learn new concepts in psychology/sociology. | 1.76 (0.55) |
| Q3. Using technology in psychology/sociology class makes learning easier. | 1.94 (0.57) |
| Q4. Working in teams help me grasp concepts in psychology/sociology. | 1.74 (0.82) |
| Q5. I feel more motivated when we are doing group activities in psychology/sociology class. | 1.88 (0.90) |
| Q8. I learn better when working in groups in psychology/sociology class. | 2.03 (0.79) |
| Q11. During a typical psychology/sociology class, I feel very motivated to work hard and achieve success. | 2.18 (0.62) |
| Q13. I like to raise my hand in class to answer questions/present solutions in psychology/ sociology class. | 2.45 (0.61) |
| Q15. I would rather complete a project or make a presentation than take a test in psychology/sociology class. | 2.35 (0.84) |
| Q18. I like to try and solve psychology/sociology problems outside of psychology/sociology class. | 2.00 (0.69) |
| Q19. I like to discover new concepts for myself. | 1.74 (0.61) |

For reporting purposes, the following number aligned to the available responses, 1-Strongly Agree, 2- Agree, 3-Disagree, and 4-Strongly Disagree. Thirty-four students responded, and upon receipt of the signed consent form, completed the survey via the *Qualtrics* survey system. Of the 20 questions listed, 11 aligned to Null Hypothesis 2. The researcher conducted a *t*-test of two independent means to see if there was a difference in self-directedness survey responses before and after the implementation of problem-based learning.

A preliminary test of variances revealed that the variances were equal. The analysis revealed that the self-directed scale survey responses after PBL was implemented ($M = 33.57$, $SD = 3.82$) were significantly different from those before PBL was implemented ($M = 29.00$, $SD = 3.87$); $t(30) = 3.03$, $p < .005$. Therefore, the researcher rejected the null hypothesis and concluded that the self-directed scale survey responses after PBL was implemented were significantly higher than the self-directed scale survey responses before PBL was implemented.

**Qualitative Analysis**

The purpose of the qualitative findings was to provide insight to faculty perceptions and understanding of problem-based learning, methods of student engagement and motivation, preference for traditional instruction versus problem-based learning model, and activities which initiate self-directedness among students in general studies courses. Additionally, the researcher previously conducted several semesters of observations in the Introduction to Psychology course, based on several concerns regarding student behavior, low summative assessment scores, and the negative feedback stated on end-of-course surveys. It should be noted; the researcher was the department

chairperson of general studies courses at the Midwest Technical College used in the research study.

Upon confirming research participation via the research consent form, two students participated in a 45-minute interview, and 11 general studies faculty members participated in a focus group. The focus group participants were eager to discuss classroom techniques and rendered insight towards improvements. These instruments allowed participants to offer ongoing insight into knowledge of problem-based learning, perception and uses. Additionally, the participants' responses formulated new themes which analyzed and contributed to the findings.

**Research Question 1**

**RQ1**. Which PBL activities helped students comprehend the subject content?

Overall, faculty appreciated the opportunity to participate in a focus group regarding instructional methods and best practices used to engage, motivate, and create better learning environments for technical students in general studies courses. This measurement of data collection was a valuable technique for examining challenges and methods for continuous improvement and allowed the researcher to gain additional insight through collective discussion. As stated by Berg (2004), focus group discussions encouraged freedom of speech on the intended subjects and an excellent source of data collection. The instrument additionally allowed faculty to express best practices of instruction and detect areas for improvement and modification.

This research question involved several components, which were addressed in the faculty focus group. Using the coding system outlined in Chapter Three, the researcher segmented the question into the following themes: group discussions and forums, group

projects, and research assignments. Five faculty participants referenced using group discussions and chatroom forums, group projects, and research assignments as problem-based learning activities.

**Group Discussions and Forums**

One participant stated,

> I use discussion forums every week. Students have to solve problems within the forums. So, it's not just 'give your opinion,' 'I like this, or I don't like this.' This method supports the 'why' you are saying this answer. Why would you solve something this way? What steps would you take to come to a solution? So basically, forcing them to think as opposed to just saying, 'I like it. I don't like it. I like your opinion. I don't like it.'

**Group Projects and Research Assignments**

Another faculty commented, the use of student projects increased the comprehension of subject content. She stated,

> I teach developmental English, and one of the projects I will have students do is to look at their respective industries, and present a client letter, or maybe a client complaint, or something of that nature. The goal is for you to go through, look at the complaint and apply those grammatical tools that you have learned, and apply them. Determine what is this client trying to convey to me? How do I need to respond? And then, what is the structure that I need to provide this in.

Finally, a participant commented, "I assign activities where students have to create, model or design something, while incorporating content information from class discussions and readings." The participant further stated, "By incorporating simulations,

students are able to apply the information, and go beyond the readings and discussions of the material. It also aids in developing their analytical, critical thinking, and problem-solving skills needed in the workplace." Two technical students agreed to participate in student interviews. Upon being asked what learning activities they preferred in general studies courses and their preferred instructional format, they both agreed the problem-based learning format was preferred and easier to understand new concepts.

One student stated,

> We have both online and seated courses. I don't care for online classes in general studies because those are basically fill in the blank courses and the instructor does not engage the students. Everything is so predictable. I am more of an explorer. I think majority of student attending technical colleges are more hands on in nature and not the student that can sit in the classroom for long periods of time listening to the unchanging intonation of the instructor. It is this learning format, I believed has caused me to be unsuccessful in online courses. I like to be in the midst of receiving new information and I don't believe online formats engage students to the level of content understanding. When I am in a classroom environment, I hear what students are saying and I see their expressions. I don't have to wonder or go back in my thoughts and review something online to try and get a clear understanding of the information. I am more successful in seated classes where I can be engaged with my classmates and probably even learn something from them based on their prior experiences.

The other student stated, "I like the classes where I can be engaged in conversation and in doing the work. I think the Problem-Based learning format suits me

well." The student further stated, "I like to participate in group discussions and engage in in-class projects. "In the problem-based learning class, instructors are there to explain the information in a better manner than in the traditional format where there is just lecture and Power Point slides." The student further stated, he would love more involvement and engagement with his classmates in the online format.

**Research Question 2**

**RQ2**. What facilitation methods used by instructors align with the problem-based learning model and the traditional model?

Three instructors commented and agreed the assignments requiring some form of engagement were the best way to align instruction to the problem-based learning model. Engagement was a common theme derived from this research question.

**Engagement**

A respondent commented, "Activities that require hands on manipulation to solve a problem are the best way to teach and this is the best form of learning." The instructor further stated, "When students are given the opportunity to read, touch and handle objects, a feeling of ownership appears, and students take pride in their efforts of accomplishment and the information is retained."

Another participant stated,

> As a math instructor the majority of my time in the classroom has been using the traditional method of lecturing. I was an elementary school math teacher and the old fashion way of students at the board has been a great way of engagement and verification that they understand the content. Here at this technical institution, I

> teach elementary and intermediate algebra and what I have noticed, the act of the students doing the work in class has offered positive feedback.

Another participant referenced his satisfaction with traditional methods of instruction but identified engagement as an important factor in the classroom.

> I'm satisfied teaching with in the traditional format, which includes lectures to an extent. If it is the only way that I teach, I feel like I'm failing as a teacher. But I feel that we must have some lecture, because we all must learn as adults, verbally from time to time. If we are not training our students to learn, sit and listen, we are doing them a disservice. They are going to have a gap in their ability to gain knowledge outside of the classroom. They need multiple ways to gain knowledge, and lecture is one, it should just not be the sole way we learn and teach students.

Finally, a faculty member stated,

> As an online instructor majority of the course activities are embedded in the institution's learning management system. As stated previously, chatrooms, forums and discussion boards align more to the problem-based learning model. I tend to lend more towards the discussion board. I teach 8-week business classes and time can be a factor. If I require any group activities, many of the students are loss as to ways they will complete the task. Seemingly, they are unfamiliar with various forms of technology and unaware of how to work collaboratively in online classes.

Aspects of technology were discussed in relationship to facilitation methods and the alignment to problem-based learning and traditional learning models. The faculty focus group consisted of both ground (seated) and online facilitators. They provided additional

insight into the technological methods used in the classroom, other resources warranted for online learners and if students were knowledgeable to the various online applications that could enhance learning in an online format.

**Technology Uses in Instructional Formats**

One instructor stated,

> I teach in the online format exclusively, so, I assign PowerPoints and I do a short lecture whenever I post my weekly announcements. But, by and large, I give plenty background, they have assignments and quizzes, critical thinking questions every week. I think these types of assignments fall under the problem-based learning category. In addition, my student will have two big projects at the end of the semester. I think the background they get with the assignments and the quizzes, the readings and everything, they tend to do pretty well on those two projects at the end of the class. Unfortunately, or fortunately, the online is just different.

The instructor continued on to say,

> Many would think students attending technical college are well versed in technology, however; this is a fallacy. Many of my student have difficulty navigating around the learning management system with makes it somewhat challenges for student success. In the past, there have been students who complained about group projects and ways to communicate with team members.

Another instructor stated,

> I would like to use Skype. I have never been Skyped by any student at this college. I have included my Skype account and contact information in the

> syllabus; however, I have never been contacted any student. Additionally, I would love a program like WebEx. I host an hour-long WebEx every single week where students can contact me with questions and comments, again no student engagement. Apparently, this mode of communication is not their technology speed. So, we have to speak their technology language, not expect them to come to us, but us come to them sometimes. And as much as I would prefer to use this, I'm not sure our students are up to that traditional, that new technology, that I would like them to be at.

Equally, another instructor stated,

> There is a problem in the learning platform in this type of institution. We must understand students at this technical college are not prepared for technology, like my colleague stated earlier. We must spend additional time teach students how to navigate the computer and compatible software. Our students are returning adults especially, many of them only know how to communicate via text, so my only route for feedback is texting. If I were to respond to students in this manner, it would keep me up at least to 1 o'clock in the morning waiting until some of these guys get off work. That is the mode for communicating to this generation.

Finally, an instructor commented on additional resources needed in the classroom. The instructor stated,

> I would like audio and video online resources which would allow me to communicate in a similar format as in my ground (seated) courses. In my online courses as the instructor, you kind of miss that type of personal interaction from the students. In the on ground (seated) courses, there is wisdom and knowledge

> imparted in that traditional method. And if information is done in an engaging manner, the content mastery can be much longer-lasting in terms of retention. I think this component is absent in the online format. If students know my name, I'm lucky and that is something I don't like. Students in my seated class students get so much more from me and they walk out totally different from the experience. But it would take some level of investment to do that in an online format.

**Research Question 3**

**RQ3**. What are faculty's perception of the Problem-Based Learning model in general studies courses in a technical college in relationship to students, motivation, academic achievement, engagement and self-directedness.

**Motivation**

One theme formulated from participants' responses from this research question was motivation. The researcher found during the faculty focus group discussion, three respondents agreed they had tried several techniques to motivate students, but were not well-versed in the components of problem-based learning. One instructor commented, "I like to mix up the assignments with Power Points and handouts, but I really did not understand how to incorporate real-life situations into a subject like mathematics." The nine other instructors were aware of the problem-based learning model and had been incorporating various activities they felt would motivate students to become engaged. One instructor stated,

> In my classroom, students receive four or five problems to solve within a 16-week course. This process requires students to read, research, write and discuss their

> findings with fellow students. One part of the process is answering questions from other students that did not have the same questions. The final piece of their requirement is to apply their findings to real-life situations and workplace challenges. This is a social science class and many times this is where the tactile student falls off the wagon. They cannot comprehend how a psychology or sociology course adds value to their perspective major. It is not until we have worked through course content via case-studies or group research where the student identifies real-life similarities or realize some relationship and can apply the content learned.

**Group Projects**

Likewise, group projects were continually mentioned in the faculty focus group while discussion faculty's perception of problem-based learning. Faculty instructing both ground (seated) and online sections of general studies courses had incorporated group projects into the curriculum. An instructor commented, "Utilizing group projects causes students to get more involved and motivated based on the realistic activities utilized to comprehend the subject content." She further stated,

> traditional technical students are mainly the students who hated high school, went right to work and now are returning five, 10, 20-years later to a college setting. Group projects provide an outlet and really gets them thinking, 'how can I incorporate my previous experience into this discussion or project.'

Additionally, a faculty member commented, "[A] majority of my students are in the diesel program and they are very challenged by an assignment that is not hands on." He further stated, "Teaching an oral communications course, it is very difficult for his

students to participate and understand course content if they are not physically tasked with an activity." The instructor continued, stating,

> In oral communications, there are four summative assessments required for content mastery. I literally must create 'role playing' activities to disguise assignments. These students are literally terrified when thinking they must present information to the entire class. Many of the students work for a local oil change company, so I have them assume the role of a customer and the service manager and it works great!

Finally, he stated, "In order for his students to understand the task, he must create value added assignments." This feedback incited other instructors' comments which lead to and additional theme, the academic readiness of recent high school graduates.

**Academic Readiness of Technical Students**

The oral communications instructor stated, "As instructors, we must understand in many instances, our students selected technical college based on unfavorable circumstances at the high school level. It is possible that courses like general education where the source of difficult for student success." Another instructor agreed stating, "Yes remember, the students who elected to work right out of high school are now here to obtain certificates and associate degrees. These are the ones that did not fair well and now are again confronted with this academic barrier." She further stated, "The tone level of many students drastically declines upon realizing general studies courses are required in order to obtain technical certifications and associate degrees in a technical college. Upon entering the classroom, the enthusiasm and motivation immediately deteriorates."

**Student Engagement**

Based on that comment, three instructors stated they were satisfied with teaching in the traditional format, but felt there needed to be more engagement which possibly initiate enthusiasm and motivation would. One instructor commented, he was satisfied with the traditional learning format, but felt there was not enough doingness from the students. He stated,

> I always look at my lectures as the structure of whatever the lesson is that I'm covering. I try to put students into the mindset that they are reading a manual you included when you are assembling something. Now you can probably look at the box and say, "Oh, this goes there and that goes there," but then you have all these 80 pieces that have a particular purpose, so I always look at my lectures as the framework for the build. After that students can apply the information and get engaged. I continually look to see other ways students could get engaged and motivated to learn. I look at lectures or the traditional style of instruction as a foundation to the process of learning. So, in that respect, I think it's a good way to start.

In the same way, an instructor stated, "I'm satisfied teaching in the traditional format it to an extent. If it is the only way that I teach, I feel like I'm failing as a teacher." He also stated,

> I feel we must include some lectures or means of disseminating information verbally because we all have to learn, as adults, communicatively from time to time. And if we are not training our students to learn by sitting and listen, then they are going to have a gap in their ability to gain knowledge outside of the

> classroom. There are multiple ways to gain knowledge, and lecturing is just one. It should just not be the sole way that we education our students. The teaching platform must include some form of student engagement.

Additionally, an instructor stated,

> I am satisfied with the traditional method of instruction, but I think you must engage the students. So as the instructor, you need to ask questions that make them think. Just not 'yes or no' questions, but questions where students will expound more than yes or no answers.

A third instructor commented,

> Our students are not like the traditional college student. I still think a lot of them are surprised when they find out there are general studies courses required as part of their curriculum. Because they had not expected to attend a traditional four-year college they thought they were just learning a skill in order to get a job. I think, some of them are surprised by being required to take these classes. The students come to class not really looking forward to it, and so as instructors, we have to do a lot of adapting to communicate with these students. I'm comfortable lecturing but, they are not getting everything from the lectures. As everyone else has stated, you must engage them in some manner. So, for my class, I make them do hands-on activities where the actual doingness comes in to play in relationship to course content.

Note taking is another method of learning that coincides with the traditional format of lecturing and can be categorized as student engagement. One respondent stated,

> Note-taking is one of the hardest tasks a student can do in the classroom and is an activity traditionalist believes works best. Students may think they can retain the information while seated in class, but once they walk away, half an hour later they have nothing.

Another respondent agreed stating,

> I think taking notes is important in any class, but I think a lot of students don't know how to take notes. I force students to take notes if I am lecturing or presenting a PowerPoint. I also post the information on our class page so that they can go back and look at it later.

Majority of the faculty stated in the traditional learning format, group discussion was limited, however; platforms where students can bounce ideas off each other seemingly enhances learning and assimilate to student engagement. As one instructor stated previously, "I used forum discussions every week where students solve real-life problems." Additionally, an instructor commented, "I find activities that promote group interaction really levels the playing field." Furthermore, "understanding your audience and the fact that you are dealing with adults with prior experiences where they can learn from each other, so the group discussion activity provides a great learning platform." The researcher found during the student interviews, both students agreed group discussions were more informative and provided a visual understanding of the content being studied. The researcher noted one student comment,

> My general psychology instructor changes the learning format on a weekly basis. Majority of the time we sit in a circle and discussion the topic at large. The next session we may be broken up into smaller groups relating various situations as it

> relates to our personal life. I really like this style of learning and I think I learn better this way." Currently, I have two instructors who have changed the format of the class and everyone seems to like it.

He further stated, "In my communications course, we are already paired up in teams and each group has a specific piece of the project to complete the task, so this creates a very interesting assignment."

**Research Question 4**

**RQ 4***:* What are students' perceptions of problem-based learning vs. traditional models?

Of the 34 student participants, two students were interviewed regarding cognition and knowledge of problem-based learning and preference for instruction. One student stated,

> Problem based-learning is a model, cognitive way to teach students new ideas by hands on approach instead of drilling and memorization. All the assignments are hands on in nature. You give someone a problem to solve and they use their own intuition and problem-solving strategies to come up with a resolution without telling them how to solve it. You give them different tools instead of just giving them the answer allowing them to cognitively solve problems.

The other student stated,

> My understanding of problem-based learning is basically working through the information provided by the instructor. This is very similar to the classes I take in my major (skilled trade) courses. We learn about a particular concept or process and we apply the information to the current situation.

In addition, both students commented on the traditional learning model. One student stated,

> In college it has been more of a problem-based learning environment, but in high school it was more of the traditional model. For example, I wanted to learn Spanish, but it was not until I met a lady from Columbia where I had to use Spanish, putting it into use was I able to learn and understand the language.

The student continued and stated,

> As an Information Technology major, our classes are totally hands-on. I understand better learning while doing. We are provided the schematics, flow charts and mechanics of the content, then our task as students is to put it all together. Just doing it help me to understand the concepts better than just telling me. When I was a child and wanted to learn how to ride a bike. I had training wheels meaning I was guided in some form of fashion. I was actually able to learn and do at the same time. I took time to practice still guide by the training wheels. I think this is the best way to teach others when they are learning a new concept outside of the traditional method.

The other student stated,

> I am use to the traditional method of instruction which includes, lectures and taking notes. I do ok with it, but I am much better when we are grouped together than working by myself. I can always ask my partner if I run into problems and just bounce ideas off my teammates. This is why I am successful in my major (skill trade) course than in my general studies courses.

Additionally, one student referenced his enjoyment in having the independence to lead his own learning. The student stated, "Being independent in the classroom is just like learning how to ride a bike. Your parents are there to put the training wheels on and give direction, but you cannot learn just by listening you actually have to do the work." He further stated

> Regarding the classroom, once you are given the information you should be able to use what you already know via, the textbooks, your classmate's conversation and maybe through research gathered by your classmates. I think if teacher stops enabling students, this would cause them to use their brain and critical thinking skills to solve the problem. In my experience, when I taught others, I believed they were able to grasp the information because I used real-life situations. When you are collaborating in a group and you are able to share your experiences, it would make me better and the information is impressed more in my mind because I have heard the concept and it was used in a situation or real-life experience.

**Other Emerging Themes**

This study was conducted to investigate if modifying the then-current teacher-centered traditional learning model to a problem-based learning model induced a difference in academic achievement, motivation and engagement, and the self-directedness of technical students enrolled in general studies courses. The study aimed at determining student and faculty perceptions and perspectives of the traditional learning models, as compared to the problem-based learning model. Four additional themes emerged as data were analyzed, giving way to possible constraints against the inclusion

of the PBL model: (a) maturity level of students, (b) use of technology, (c) pedagogical conditioning, and (d) additional faculty task.

**Emerging Theme #1 Maturity level**. Several faculty mentioned during the focus group discussion, the importance of conceptualizing the maturity levels in today's classroom. One instructor stated, "The problem-based learning model will work for some students, but what about the recent high school graduate that needs direction and continued support"? An instructor commented,

> I feel like the traditional technical student at our institution are the students directly out of high school especially for our day-school program. Majority of this group strongly disliked sitting in the desk having someone talk or lecture to them in high school and are reluctant to re-live the same scene in college. Additionally, these groups are highly dependent on the facilitator for direction. If the instructor fails to point out each aspect of the learning continuum, the student will mostly be unsuccessful.

The instructor continued and stated,

> On the other hand, we have a good population of non-traditional students, adults who strongly disliked high school, who went right to work, and now are returning after five, 10, 15, 20 years to a college setting. This non-traditional group, in many instances need additional assistance in reading and math and in most cases, assistance in navigating the computer. She further stated, "It is even with a course like mine, an organizational behavior class, it is readily relatable to their real-world experience. So, they're learning and also bringing their experience when they share with the group. To say, "Well, this is what happens in my workplace."

> And it quickly becomes a much better method of reinforcing the theory and the principles you're trying to teach. I think with the non-traditional group and their maturity level, problem-based learning would be a learning advantage.

**Emerging Theme #2 Use of Technology.** Another common theme expressed during the focus group discussion regarding best practices and method of instruction for technical students was student knowledge and use of technology. As stated previously, the misconception is today's students are well versed in the use of technology. With the increase in online learning, more assignments require the use of technology. According to Isenberg and Titus (1999),

> Adult learners are provided with a plethora of information at their fingertips through the Internet. However, the accessibility, volume, and speed of information and the practice of 'surfing the net' raise a practitioner's concern over the user's ability to meet learning needs (p. 5).

Likewise, and instructor commented,

> I would like to use, and I have offered Skype to my students. I have never been Skyped by any student at this college. I have a Skype account, I say from this hour to this hour I am on my Skype, and I advise the students they can Skype me anytime. This college never uses it. I have other colleges where I do use my Skyping on a regular basis.

The instructor continued and stated,

> I would love a program like Webex. I host an hour-long Webex every single week where kids can communicate with me regarding course stuff. I am sitting there in front of my computer with my camera on me, my video on, and nobody

> shows up. These kids do not know how to communicate via the internet. That is not their technology speed. So, we have to speak their technology language, not expect them to come to us, but us come to them sometimes. And as much as I would prefer to use this, I am not sure our students are up to that traditional, that new technology, that I would like them to be at.

Equally important, an instructor stated

> I use YouTube and I post YouTube videos right on the whole thing. And I have got a little cheap setup. But I would love a room here that I could do a high-end video recording. Then we could do some video editing here. And actually, do some nice stuff. That is what I would like, but will the student now how to access the information? That is my utmost concern.

In addition, another instructor commented,

> I have tried what he said. Certain times, saying you are going be on the internet, nobody ever comes on. Now I have had people, because I give them my cell phone, that have called me, and I help them that way. I have been able to help them more, what I do is I will go step by step, send it to them, and then we will go through the steps.

Finally, and instructor stated,

> Our students, students in this generation, and just people in general, I will not even just say students . . . Technology wise, they are very advanced when it comes to social media, texting and all of that. And we assume that, because they are good with those platforms, that when we give them something educational that they will easily adapt. But they do not. They have not been trained on things

> like that. We say, 'Oh, they are so technology advanced, when it comes to Facebook and things like that, but when it comes to other platforms, they need a little bit more help.'

The instructor continued and stated,

> I think that goes back to the confidence factor. I am very confident in my Instagram page. I am just going to post my Instagram life. I am not going to post when I was crying because I got a flat tire and my other unfortunate challenges unless I am very confident, and I think, it's that same kind of thing when you're working on something. You're like, 'I do not get it, I don't know it.' It is very easy to go, 'Well, I will just take whatever grade I get.' As opposed to really plowing in and trying to find a solution.

This leads to another theme created in the focus group, Pedogeological Conditioning.

**Emerging Theme # 3 Pedagogical Conditioning**. Additionally, the instructors made several comments concerning the need for teacher guidance and the need for a step by step, Kindergarten through eighth grade instructional approach. One instructor stated, "Many of these students are well-garnered in the parental guidance of the instructor leading the way as a in facet in student success. In this case, it is the students coming right out of high school." Another instructor stated,

> I teach high school and I have taught at several schools and I will tell you that, there is about a 15-minute lecture time, and then students' eyeballs just start glazing over. I do not care what student I am teaching; how smart they are. About 15 minutes in to the lecture, I need to stop, we need to change. We need a

> different activity. Many of them will not engage in conversation or in an activity until the instructor brings them in.

Finally, the last emerging theme focused on additional time instructors would need to create effective problem-based learning curriculum. The instructors discussed the additional resources the institution should provide to include a problem-based learning format in the curriculum.

**Emerging Theme # 5. Additional Faculty Task**. Majority of the instructors welcomed the possible inclusion of a problem-based learning format to the curriculum, but two instructors questioned the need for additional resources and time to create problem-based learning activities. One instructor stated,

> I would like to use audio and video for my online courses. This would allow me the ability to create assignments that would be more engaging and would relate to real-world experiences. The current resource here at this college limit us from the creativity required for problem-based learning activities in addition to the additional time with would take to gather the materials.

Another instructor stated,

> I do not know if there is current problem-based learning materials available for many of the general studies courses or if that would be an additional requirement of the faculty to create the material. I know many of us are doing problem-based learning activities, but; like the mathematics class, that information would need to be created.

There were many topics covered in the faculty focus group, which could bring great insight to the institution regarding then-current curriculum and possible

improvements to the general studies department. Additionally, the instructors perspectivity and knowledge of problem-based learning, and perception and use in the classroom, highlighted areas for continuous improvement after comparing problem-based learning to the traditional learning format.

**Summary**

This mixed-methods study showed modifications were needed in regards to creating value-added curriculum relevant for technical students enrolled in general studies courses. The qualitative data from faculty and technical students highlighted areas warranted for instructional modifications that would allow the inclusion of problem-based learning activities as a route to value-added instruction. In addition, other themes also emerged regarding the implementation of problem-based learning. Faculty agreed there was a need for professional development courses grounded in active learning environments and problem-based learning activities. Equally important, the maturity level of students and the pedagogical conditioning of faculty incited areas for improvements. Finally, conversation arose regarding the amount of time faculty needed to create engaging curriculum and situational activities for technical students taking general studies courses.

Quantitatively, minimal differences were noted regarding end-of-course student surveys; however, significant differences were highlighted in the summative assessment scores of technical students before and after the implementation of problem-based learning activities. Furthermore, significant differences were noted in the self-directedness scale survey before and after the implementation of problem-based learning.

Chapter Five provides suggestions for administration and faculty to enhance current curriculum and become more inclusive of the students' needs when designing general studies curriculum.

# Chapter Five: Discussion and Reflection, and Recommendations

## Overview

To evaluate the relationship between problem-based learning, academic achievement, engagement and motivation, and self-directedness of technical students enrolled in general studies courses, the researcher investigated social science courses at a Midwest Technical College. Through the evaluation process, the study aimed to determine if there was a difference in the academic achievement, engagement and motivation, and self-directedness of technical students enrolled in general study courses after the implementation of a problem-based learning model. To examine general studies courses, the researcher analyzed students' and faculties' perspectives and perceptions comparing traditional learning models to problem-based learning models. Additionally, the researcher analyzed institutional end-of-course survey results and the summative assessments scores of psychology and sociology students from fall, spring, and summer 2016-2017, 2017-2018, and fall 2018, before and after PBL implementation. By completing the quantitative analysis, the researcher hoped to accomplish the following: determine whether there was a significant change in the students' understanding and retention of subject content, if students took an active role in leading their own learning and taking responsibility for decisions made, if students were motivated to learn, and finally, if students understood why they had to learn or the value added from learning the course content in a general studies class. Through the implementation of problem-based learning in the psychology course, the researcher hoped to pinpoint ways to improve the general studies curriculum at the technical college, aligning curriculum and course design to the needs of today's adult learner. Additionally, this study examined technical

students' and faculty's knowledge, perception, and understanding of the problem-based learning model. Equally important, the traditional format was discussed, which offered insight to continuous improvement.

**Triangulation of Results**

The arrangement of Chapter Five is based on the results gathered from multiple research instruments used throughout the study. This process of triangulation ensured cross verification of data, which offered insight to general studies courses and areas for adjustments. Hypothesis one compared end-of-course institutional surveys and summative assessment scores of technical students, before and after the implementation of problem-based learning. This instrument allowed the researcher to analyze possible differences and highlight students' perceptions and knowledge regarding general study courses, once completed. Additionally, this hypothesis related to several research questions, which were addressed through analysis of qualitative data in those sections. Comparing summative assessment scores before and after the implementation of problem-based learning provided the researcher with a clear perception of areas in need of modifications and rationale for the inclusion of problem-based learning in the general studies curriculum. Equally, this hypothesis related to research questions that provided faculty feedback and insight to traditional teacher-centered instruction and problem-based learning formats.

**Alternate Hypotheses 1:** There will be a difference in end-of-course evaluations and summative (final) assessment scores between the traditional learning model and PBL model.

**Research Question 2:** What facilitation methods used by instructors align with the problem-based learning model and the traditional model?

Through review of the institutional end-of-course survey results, the data concluded there was no significant difference between before and after the implementation of problem-based learning. Technical students were asked to complete surveys upon completion of all courses taken each semester. The survey questions varied from the 2016-2017 school year, 2017-2018, and the 2018-2019 school year based on institutional updates and survey modifications. The researcher found five questions that were consistent throughout the semesters surveyed, which aligned to student learning needs for student success. After the analysis, the researcher noted these findings would not initiate changes to curriculum design, content delivery, or student engagement and motivation, based on the study's findings. The researcher further noted, the institution may need to revise or adjust survey questions to align with adult student learning needs, curriculum design, and overall learning experience. As noted by Brookfield (1986) and cited in Galbraith (1991), facilitators of adult learners should incorporate the following six principles for effective instruction:

Six Principles for Effective Learning

1. Participation is voluntary; adults engage in learning as a result of their own volition.
2. Effective practice is characterized by a respect among participants for each other's self-worth.
3. Facilitation is collaborative.

4. Praxis is placed at the heart of effective facilitation; "learners and facilitators are involved in a continual process of activity, reflection upon activity, collaborative analysis of activity, new activity, further reflection, and collaborative analysis, and so on"
5. Facilitation aims to foster in adults a spirit of critical reflection.
6. The aim of facilitation is the nurturing of self-directed, empowered adults (p. 6).

It was these six principles of learning that were continuously discussed in the faculty focus group in reference to several research questions. Throughout the faculty focus group, as discussed in Chapter Four, instructors mentioned the need to incorporate engaging assignments and activities, which would require the doingness and self-directedness of the student. The researcher found general studies courses harmonized with a pedogeological stance and were not aligned to the needs of adult learners. According to Knowles (1984), "Adults may be totally self-directing in every other aspect of their lives, as workers, spouses, parents, citizens, leisure-time users, the minute they walk into a situation labeled "education" they hark back to their conditioning in school, role of dependency" (p. 9). Knowles (1984) continued, "If adults are treated like children, this expectation conflicts with their much deeper psychological need to be self-directed and their energy is diverted away from learning to dealing with this internal conflict" (p. 9). The researcher observed throughout the focus group, many instructors called the students, 'kids,' not considering them as adult learners. It was clear and voiced throughout the discussion how the students were reliant upon the instructor, but the instructors never realized the behavior was welcomed, based on teacher-centered course

assignments and traditional lecture-based activities. Moreover, there was some research that demonstrated that the lecture approach, which was common under the cognitive realm, did little to promote student learning, as stated by Daempfle (2002), Lawson (1995), and cited in Birzer (2004).

**Alternate Hypothesis 2**: There will be a difference between self-directedness in the problem-based learning model as compared to the traditional learning model.

**Research Question 4**: What are students' perceptions of problem-based learning vs. traditional models?

Through examining the results of summative assessment scores of technical students enrolled in psychology and sociology from the Fall 2016 semester through Fall 2018 semester, the researcher observed higher scores from students enrolled after the problem-based learning model was implemented. These results could possibly assist education administration in understanding which problem-based learning activities contributed to content retention, student engagement, and whether students exhibited self-directedness in completing assignments. Active learning formats had been proven to be more engaging stimulating a higher-order thinking and critical analysis. This model increased the learner's ability to interact with others utilizing soft skills, collaborations, and group discussion (Lysne & Miller, 2017).

Additionally, the researcher concluded the significantly higher summative assessment scores of technical students in the psychology classes after the implementation of the problem-based learning model may be substantial enough to include this model in the learning format. Throughout the focus group discussion, faculty expressed the preference of utilizing problem-based learning activities as motivation to

increase the self-directedness and engagement of students. Several faculty members agreed that today's students needed activities that added value and understanding to academic theory and concepts. Additionally, the responses from the faculty focus group and student interviews related to Research Question 1, 'Which PBL activities helped students comprehend the subject content?'

The researcher found many faculty members had incorporated various components of problem-based learning into their then-current instructional format which enhanced content comprehension and retention. As stated in Chapter Four, several instructors used group discussions and chatrooms, and case-studies and research projects to facilitate instruction; as one participant stated, "Utilizing group projects causes students to get more of a realistic understanding of the subject content." Research showed incorporating students into their learning process can incite the student to become self-directed. Self-directed learning offers learners the opportunity to analyze their learning needs, create objectives and goals, consider human and material resources and employ quality and effective learning strategies (Knowles, 1975). A student response coincided referencing independence in the learning process. The student participant stated,

> When you are in a class working collaboratively in a group and able to share your experiences, this makes learning easier and the information is retained because I have heard the concept and it is clear how the information is used in a situation or real-life experience.

**Alternate Hypothesis 2**: There will be a difference between self-directedness in the problem-based learning model as compared to the traditional learning model.

**Research Question 3**: What are faculty's perception of the Problem-Based Learning model in general studies courses in a technical college in relationship to students, motivation, academic achievement, engagement and self-directedness.

Characteristics of the problem-based learning model included various components of self-directedness traits. Knowles (1984) acknowledged the adult learner as self-directed and autonomous and that the teacher was a facilitator of learning rather than presenter of content. Throughout the qualitative analysis, both the faculty and students agreed the problem-based learning model fit best in the technical environment, based on the amount of time students spent in skilled core courses, as compared to general studies courses. Active learning formats had been proven to be more engaging, stimulating a higher-order thinking and critical analysis. This model increased the learner's ability to interact with others utilizing soft skills, collaborations, and group discussion (Lysne & Miller, 2017).

**Recommendations**

Overall, technical students expressed satisfaction with problem-based learning activities. The data strongly suggested engaging classroom activities and interactive learning environments contributed to student motivation and content retention in courses non-technical in nature. According to Gudduz, Alemdag, Yasar, and Erdem (2016), interactive learning environments provided a different approach to create active learning processes. Lai and White (2014) stated students involved in interactive learning environments created platforms for group-oriented behavior. Further, students listened to one another, sharing the same focus of attention and the engagement in coordinated activity was extremely high (Lai & White, 2014). This type of surrounding strongly

influenced the constructivist learning theory; whereby, students were active in building and organizing information (Baeten, Dochy, & Struyven, 2013). Self-determination and autonomous motivation were characteristics presented by students when the learning environment nurtured the basic psychological needs for autonomy, competence, and relatedness (Baeten et al., 2013).

Additionally, student respondents favored group activities and projects crediting these instructional formats and made learning the content easier. Feedback stated in Chapter Four highlighted technical students' comments regarding engaging course activities. One student stated,

> I am in the Information Technology major and in these classes, everything is hands on. I understand better learning while doing. We are given the schematics, flow charts and mechanics of the content, then our task as students is to put it all together. Just doing it help me to understand the concepts better than just telling me.

The survey responses would also suggest student motivation increased, based on group discussions and other characteristics of PBL formats. Comparisons of summative assessment scores before and after PBL implementation suggested technical student scores improved. Moreover, there was some research that demonstrated that the lecture approach, which was common in the classroom and under the cognitive realm, did little to promote student learning, as stated by Daempfle (2002) and Lawson (1995) and cited in Birzer (2004).

It is this researcher's recommendation institutions implement problem-based learning activities into the general studies curriculum. Based on the research, technical

students will overall perform at a higher academic level with the ability to apply knowledge learned. Furthermore, for technical students to consider general studies courses as value added, department chairs from both technical majors and general studies courses must collaboratively create real-life or situational activities that blanket both technical and soft skills to enhance the overall learning experience. As stated in Chapter Four, from faculty focus group responses, one participant stated,

> I teach developmental English, and one of the projects I will have students do is to look at their respective industries, and present a client letter, or maybe a client complaint, or something of that nature. The goal is for you to go through, look at the complaint and apply those grammatical tools that you have learned, and apply them. Determine what is this client trying to convey to me? How do I need to respond? And then, what is the structure that I need to provide this in.
>
> Finally, a participant commented, 'I assign activities where students have to create, model or design something, while incorporating content information from class discussions and readings.' The participant further stated, 'By incorporating simulations, students are able to apply the information, and go beyond the readings and discussions of the material. It also aids in developing their analytical, critical thinking, and problem-solving skills needed in the workplace.'

Equally, feedback from a student participant agreed that problem-based learning assisted with inciting students to use prior-experiences and situations to problem solve. As stated in Chapter Four,

> I am better when we are grouped together than working by myself. I can always ask my partner if I run into problems. Well at a technical college and especially in

many of the general studies courses, the only way to learning the concept is through PBL.

Equally important, general studies faculty should be trained on the problem-based learning model and on ways to creative curriculum that is engaging and keeps students motivated. Also, offering workshops on training the adult learners would prove as an asset to both faculty and student. It is important for facilitators of adult learners to understand the characteristics, focus, and purpose of many students deemed adult learners returning to school. Curriculum must consider and be inclusive of this audience for overall program and student success.

**Recommendations for Future Research**

For the future, this study should continue with incorporating the problem-based learning model in other general studies courses. Curriculums in math, English, and communication courses should include situational assignments, group discussions, and projects, and be analyzed qualitatively through faculty focus groups and student interviews; while further monitoring the results, implications, and recommendations through quantitative studies with end-of-course student surveys and results from summative assessment scores after problem-based learning model implementations. Other technical colleges and universities should also complete similar studies to determine if the inclusion of the problem-learning model and andragogical adult core principles for teaching adult learners will enhance program offering, strengthen student success, and provide overall stronger content retention and applied skills.

Other studies should include continuing to examine the inclusion of interactive learning environments, problem-based learning, and other methods of student

engagement. As more higher-level learning courses move out of the classroom into online formats, it may be difficult to engage students and require more thought in creating assignments. Additionally, more research should be conducted on incorporating Andragogy as the learning model in secondary educational settings. It is important for high school students to learn how to work in teams and build critical thinking and reasoning skills at this stage.

**Conclusion**

As the 21st century workforce continues to shift, institutions must prepare skilled workers with not just technical skills, but also with attributes that will allow for success in the workplace. Many key skills and competencies are created by large in academia. Institutions of higher learning must put away traditional teacher-centered styles and methods of instruction and apply what works for the current 21st century student. As noted previously, there are many students that are still dependent on the guidance and direction of the instructor. Additional steps to integrate self-directedness through problem-based learning activities is required to assist students through this transitional period.

The workforce seeks employees who can communicate effectively, make decisions, and who can work collaborative towards solutions. It is these skills that can be discovered and polished in academia and the implementation of problem-based learning. Technical colleges can be the driving force making a major contribution to the workforce development by welcoming this instructional change and implementing learning formats of this nature.

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# Appendix A

## Focus Group Questions (Adjunct Faculty)

1. How satisfied are you with traditional learning formats in general education courses which includes teacher-center lectures, power points, etc? **RQ2**
2. What is your knowledge of Problem Based learning formats in general education courses? **RQ2**
3. What specific elements of a traditional learning format do you favor or prefer? **RQ1, RQ2**
4. What specific components of traditional learning formats would you like to change? **RQ2, RQ3**
5. How likely would you allow students to lead their own learning through case studies research, team projects and small group interaction? **RQ1, RQ3, RQ4**
6. What classroom activities do you use to initiate engagement of students in your current classroom? **RQ1, RQ2, RQ4**
7. What specific activities offer self-directedness and knowledge retention in a traditional learning format? **RQ1, RQ2, RQ3, RQ4**

# Appendix B

## Open-ended Interview Questions (Students)

1. Tell me about your experience taking general studies courses. **(RQ4)**

2. How do you learn best in general studies courses? **(RQ1, RQ4)**

3. How would your ideal general psychology class be designed to ensure you are engaged and motivated? **(RQ1, RQ4)**

4. Describe your current study methods to remember course material in your general studies courses. **(RQ1, RQ4)**

5. Tell me about your level of understanding after being in a classroom that allows group discussion, self-directed format in a general psychology course? **(RQ1)**

6. How do you feel having the independence to lead your own learning in general psychology class guided by the instructor? **(RQ1, RQ4)**

7. What was your level of motivation and engagement with Problem Based Learning activities in the general psychology course? **(RQ1, RQ3, RQ4)**

8. What are your thoughts about Problem Based Learning (student-centered) formats versus traditional (teacher-centered) lecture formats as it relates to a technical program? **(RQ2, RQ3, RQ4)**

9. Describe the PBL activity which helped you learn the best? Why? **(RQ1, RQ2)**

10. What causes you to be self-motivated in your traditional general education course? **(RQ2, RQ3, RQ4).**

## Appendix C

## Self-Directedness Scale

Please make every effort to provide complete and accurate information for each question in this questionnaire. Circle the answer that best describes your feelings towards the statement.

1. I work hard to be successful in psychology/sociology because I will need to use psychology/sociology in my future.

**Strongly Agree Agree Disagree Strongly Disagree**

2. Performing classroom examples helps me to learn new concepts in psychology/sociology.

**Strongly Agree Agree Disagree Strongly Disagree**

3. Using technology in psychology/sociology class makes learning easier.

**Strongly Agree Agree Disagree Strongly Disagree**

4. Working in teams helps me grasp concepts in psychology/sociology.

**Strongly Agree Agree Disagree Strongly Disagree**

5. I feel more motivated when we are doing group activities in psychology/sociology class.

**Strongly Agree Agree Disagree Strongly Disagree**

6. Psychology/sociology class stresses me out.

**Strongly Agree Agree Disagree Strongly Disagree**

7. My teachers have encouraged me to take more psychology/sociology courses in the future.

**Strongly Agree Agree Disagree Strongly Disagree**

8. I learn better when working in groups in psychology/sociology class.

**Strongly Agree Agree Disagree Strongly Disagree**

9. I feel nervous when the teacher calls on me in psychology/sociology class.

**Strongly Agree Agree Disagree Strongly Disagree**

10. I would like to avoid psychology/sociology in college.

**Strongly Agree Agree Disagree Strongly Disagree**

11. During a typical psychology/sociology class, I feel very motivated to work hard and achieve success.

**Strongly Agree Agree Disagree Strongly Disagree**

12. I become anxious and forget important concepts during a psychology/sociology test.

**Strongly Agree Agree Disagree Strongly Disagree**

13. I like to raise my hand in class to answer questions/present solutions in psychology/sociology class.

**Strongly Agree Agree Disagree Strongly Disagree**

14. My teacher is available for extra help in case I don't quite get it the first time.

**Strongly Agree Agree Disagree Strongly Disagree**

15. I would rather complete a project or make a presentation than take a test in psychology/sociology class.

**Strongly Agree Agree Disagree Strongly Disagree**

16. My teacher is genuinely interested in seeing me be successful in psychology/sociology.

**Strongly Agree Agree Disagree Strongly Disagree**

17. I do not like to ask questions in class because I don't want to look dumb.

**Strongly Agree Agree Disagree Strongly Disagree**

18. I like to try and solve psychology/sociology problems outside of psychology class.

**Strongly Agree Agree Disagree Strongly Disagree**

19. I like to discover new concepts for myself.

**Strongly Agree Agree Disagree Strongly Disagree**

20. I am sure I can solve most psychology/sociology problems on an exam.

**Strongly Agree Agree Disagree Strongly Disagree**

## Appendix D

Permission to use Beres' Instrument

RE: Project-Based Learning and its Effect on Motivation in Adolescent Mathematics Classroom

Tue 2/13/2018 11:44 AM
To: Myers, Kim <kmyers@brockport.edu>; PRIMM, BARBARA R (Student) <BRP004@lindenwood.edu>;
Cc: Myers, Kim <kmyers@brockport.edu>;
Feel free to adapt.

Sent from Mail<https://go.microsoft.com/fwlink/?LinkId=550986> for Windows 10

From: Myers, Kim<mailto:kmyers@brockport.edu>
Sent: Monday, February 12, 2018 7:58 AM
To: Pamela Barchet<mailto:pbarchet@kendallschools.org>
Cc: Myers, Kim<mailto:kmyers@brockport.edu>
Subject: FW: Project-Based Learning and its Effect on Motivation In Adolescent Mathematics Classroom
Importance: High

Dear Ms. Barchet,
I manage the Brockport institutional repository, Digital Commons at Brockport, and I believe that the master thesis mentioned below is yours. If so, I have received a request from a doctoral student asking permission to adapt some questions from the survey you used. Would you either respond to her and cc: me, or give me your answer and I will respond to her? Thank you for taking the time to share your research, (and I sincerely apologize if I have the wrong person)!
All the best,

Kim L Myers
Scholarly Communications Coordinator
http://digitalcommons.brockport.edu/
44J, Drake Memorial Library
The College at Brockport, State University of New York
585-395-2742
orcid.org/0000-0002-2270-838X

From: PRIMM, BARBARA R (Student) [mailto:BRP004@lindenwood.edu]
Sent: Sunday, February 11, 2018 10:38 AM
To: Myers, Kim <kmyers@brockport.edu>
Subject: Project-Based Learning and its Effect on Motivation In Adolescent Mathematics Classroom

Hello,
I am a doctoral student at Lindenwood University. I am conducting a research study on Problem Based Learning at a Technical college in the Midwest. During research, I found this study. I am interested in adapting some questions from the Motivation and Attitude Scale survey. Please advise if this is permissible.

Respectfully,

Barbara Primm

## Appendix E

## Approval from Study Site

RANKEN
TECHNICAL COLLEGE

Technical Training + General Education + Work Ethic = Technical Competence + Critical Thinking + Success

February 20, 2018

Barbara Primm request the use of Ranken Technical College as the study site for her doctoral research. She will be conducting a mixed method study to investigation the relationship between Problem Based Learning, student achievement, motivation and engagement, and self-directedness of technical students in general studies courses.

General Psychology is the course selected for the study. Students enrolled in the 2017-2018 spring and summer semesters of general psychology will be the participants taking part in open-ended interviews and Likert scale surveys. Instructors facilitating non-technical courses will partake in the focus group.

The purpose of the study is to see if the implementation of PBL activities effects overall course outcomes.

I have reviewed the summary of this proposed project and will give permission for the study.

Don Pohl

Executive Vice President

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ST.LOUIS, MISSOURI 63113
P 314.371.0236
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W WWW.RANKEN.EDU

# Vitae

## Barbara R. Primm

## EDUCATION

**Doctor of Education, Instructional Leadership (Andragogy):** Lindenwood University, St. Charles, MO (Candidate)

**Master of Education, Educational Leadership:** North Central University, Scottsdale, Arizona.

**Master of Arts in Business Administration/Marketing:** Linden wood University St. Charles, MO

**Bachelors of Arts, Management/Marketing:** Webster University, St. Louis, MO

## PROFESSIONAL EXPERIENCE

Department Chairperson of General Education & Bachelor of Science Program

**Ranken Technical College, St. Louis, MO 7/5/2016 - Present**

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- Responsible for academic and administrative leadership of General Education and Bachelor of Science program.
- Lead the department in developing and implementing immediate and long-range SMART goals and departmental objectives to meet institutional mission.
- Aide in curriculum development insuring all levels of curriculum review are met.
- Responsible for guiding the Department's Strategic Planning process
- Models effective instruction; provides on-going technical assistance; assists in strengthening lesson plans; provides guidance on curriculum alignment.
- Encourage and assist faculty in professional development training and review.
- ACBSP champion for Bachelor of Science program.
- ACBSP Regional 5 Marketing committee member

ADJUNCT INSTRUCTOR

**St. Louis Community College, Continuing Education St. Louis, MO 2015 -Present**

- Computer Technology Series, Windows 7, Office Suite 2010-2013, Files & Folders, Clouds, Quick books Pro
- Small Business, Not for Profit Management, Board Management, Grant writing
- Curriculum Design for Adult Education Courses- Computer Technology and Small Business Series.

**Ranken Technical College, St. Louis, MO /2013 - Present**

- Business 1000-Series 01,02,04,08, 09
- Instructor in the fields of Computer Literacy, Business Management and Business Ethics.
- Instruct students on the relationship between computer software and business concepts.
- Co-teaching/facilitating computer applications for business (Excel, Word, PowerPoint, Internet Explorer, Computer Concepts) for seated and online students.

INDEPENDENT EDUCATIONAL CONSULTANT/ ACADEMIC COLLEGE COUNSELOR,
**I-Search Grant and Scholarship Consultants, LLC, St. Louis, MO 1994 -Present**

- Advance level researcher, scholarship researcher, not for profit and for profit business formation.
- Writing governmental and nongovernmental grants for nonprofit organizations as well as for profit.
- Researching, editing, and handling various other administrative duties.
- Extensive research and editing all the grants before they are proposed for an approval.
- Excellent written and verbal skills as well as superb costumer service skills. Highly organized and very personable.

EXECUTIVE DIRECTOR

**Literacy & Education Applied with Purpose, Inc. St. Louis, MO. 2009-Present**

- Responsible for research, development, and writing of federal, state, and foundation grant proposals.
- Plan and coordinate educational programs and policies for specific subject area or grade level relative to academic literacy.
- Develop literacy curriculums designed to advance students in reading, math and language arts for children and Adults (ABE/GED)
- Develop principles and processes for providing personal services. This includes customer needs assessment, meeting quality standards for services, and evaluation of customer satisfaction.
- Confer with federal, state, and local school officials to develop curricula and establish guidelines for educational programs.
- Confer with lay and professional groups to disseminate and receive input on teaching methods.
- Review and evaluate curriculum for use in schools and assist in adaptation to local needs.
- Conduct and participate in workshops, committees, and conferences designed to promote literacy, social, and physical welfare of students.
- Prepare recommendations on instructional materials, teaching aids, and related educational tools.
- Scholarship review board for (KAPPA DELTA PI)
- Scholarship review board for Incarnate Word Foundation)

## PROFESSIONAL MEMBERSHIPS

- Kappa Delta Pi- International Honor Society in Education
- AAUW-American Association of University Women
- MOACAC- Missouri Association of College Admission Counselors
- IECA- Independent Educational Consultants Association
- HECA-Higher Education Consultant Association
- Order of the Eastern Starts, Adia Star Chapter 12
- Delta Sigma Theta, St. Louis Alumnae Chapter Sorority

## GRANTS, HONORS, RECOGNITIONS, CERTIFICATIONS, & LEADERSHIP

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- Future Institute Research 2018 Scholarship Recipient (Lindenwood University)
- Kappa Delta Pi- International Honor Society in Education
- Kappa Delta Pi- International Honor Society in Education (Scholarship Review Committee)
- MOACAC- Missouri Association of College Admission Counselors
- IECA- Independent Educational Consultants Association
- HECA-Higher Education Consultant Association
- Advisory board-AHA Unlimited, Inc. –Art literacy and educational not for profit organization
- Board Member Secretary- Urban League of Metropolitan St. Louis, Guild
- Board Member – Spanish Lake Business Association
- Board Member, Treasurer- United for a Better St. Louis, Inc.
- Kappa Delta Pi- Teachers scholarship recipient 2012
- Alpha Kappa Alpha, Omicron Theta Omega Chapter- Entrepreneur Recognition 2010
- Sumner High Alumni (Scholarship Review Committee)