AN EVALUATION OF IMMERSIVE LEARNING AT BALL STATE UNIVERSITY:

RELATIONS BETWEEN IMMERSIVE LEARNING

AND SELF-DETERMINATION FACTORS

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CHAPTER ONE

INTRODUCTION

Statement of the Problem: Evaluating Immersive Learning

Immersive learning is a distinct learning methodology extended to students at Ball State University (BSU). Teams of students, with the guidance of faculty members, engage in holistic experiences that are hands-on and provide services to the community in which they live. Immersive learning allows students to be fully engaged in projects as they design, implement, and evaluate programs with authentic community partners (“Immersive Learning,” 2016). These endeavors are intended to benefit businesses, and community and government partners, both locally and globally.

Immersive learning at BSU was initiated in the Virginia B. Ball Center (VBC) for Creative Inquiry. Since 2000, the VBC has supported four creative projects a year, two projects during the fall semester and two projects during the spring semester. In 2004, additional immersive learning opportunities became available for students across all of the individual colleges and departments. In 2007, efforts to officially track immersive learning projects began; and between 2007 and 2014, all seven colleges and 45 academic departments had completed more than 1,500 projects. Roughly 25,000 students engaged in these immersive learning experiences that impacted the region, state, and world.

In 2015, immersive learning became part of the university’s vision for offering entrepreneurial learning opportunities for every student. “Ball State aspires to be the most student-centered and community-engaged of the 21st century public research universities, transforming entrepreneurial learners into impactful leaders – committed to improving the quality of life for all” (Ball State University, 2015). The Centennial Commitment takes into
account the diversity of high-impact practices that BSU has to offer and places these learning opportunities on a continuum, ranging from practices that involve less to more risk, teamwork, decision-making, and impact on community. For example, study abroad and service learning fall on the lower impact side of the continuum, and undergraduate research/field studies and immersive learning fall along the higher impact side of the continuum, with many variations of these opportunities included along the continuum.

Originally, immersive learning opportunities at BSU incorporated seven characteristics or goals that distinguished the experiences from other service learning. Across its evolution, immersive learning is now defined as experiences that include these five characteristics:

- carrying academic credit and focusing on student learning outcomes.
- engaging participants in an active learning process that is student-driven but guided by a faculty mentor
- producing a tangible outcome or product, such as a business plan, policy recommendation, book, play, app, or DVD
- involving at least one team of students, often working on a project that is interdisciplinary in nature
- including community partners and creating an impact on the larger community as well as on the student participants

Moreover, it is expected that students who participate in immersive learning will develop the following learning outcomes:

- *Professionalism, Integrity, and Ethics*. Students will demonstrate a high degree of professionalism and/or integrity
•  **Understanding and Cultural Competency.** Students will be able to identify the needs of community partners and find many solutions that respect/maintain and positively impact the organizational/group culture.

•  **Communication.** Students will initiate dialogue with demonstrated support for persons with varying points of view and respect for diverse ideas by integrating those points with their own existing ideas.

•  **Ownership and Contribution.** Students will show significant ownership or commitment to the project. Students will contribute in a manner that is significantly instrumental to the success of the project.

•  **Problem and Solution Identification.** Students’ contributions will be critical and instrumental to the problem and the solution identification process. In other words, the absence of the students, and thus their contribution to the problem and solution identification, would significantly change the outcome of the project.

•  **Integrate Disciplinary Knowledge.** Students will extensively contribute their own disciplinary knowledge or expertise and will be effective at integrating knowledge from other disciplines into personal constructs in creative and meaningful ways.

•  **Teamwork, Leadership, and Conflict Resolution.** Students will successfully integrate into team as well as provide valued leadership and resolve conflicts effectively.

•  **Follow Through and Commitment.** Students will meet deadlines and facilitate the successful implementation of the mission of the group with enthusiasm and the highest competence.

•  **Quality of Outcome.** Student’s contributions will exceed the expectation of the community partner and will be of the highest quality.
• **Extended Knowledge.** The final result of the students’ contributions will be critical to the success of the project and extend the knowledge in this area significantly.

• **Transferable Skills.** Students will be able to articulate the wide variety of skills developed through the experience and will be able to articulate how these skills could be transferred to a wide variety of other contexts including the development of other competencies.

However, what is not known is whether or not these immersive learning experiences will lead to attributes that cannot be realized in traditional classroom experiences. The university developed immersive learning opportunities with the intention of creating transformative experiences for students that lead to behavioral and/or attitudinal outcomes that would be unique to those who engaged in immersive learning. However, there has never been any formal evaluation of immersive learning classes to assess how students’ outcomes might be different from those achieved in a traditional classroom.

The purpose of this study was twofold: who are the students enrolled in immersive learning courses; and do these students exhibit outcomes that would imply transformative experiences? To explore these differences between students who participated in immersive learning sections of classes and those who did not, the study was conducted in two parts. First, demographic differences between all students who had ever enrolled in an immersive learning experience and those who had not during the same time period were examined in order to glean a purely descriptive comparison. Second, students enrolled in immersive learning during the current semester were compared to those who were in similar classes not classified as immersive to explore potential transformative outcomes. A review of the literature was used to identify the
types of transformations in behaviors and/or attitudes that might be expected from engagement in immersive learning.

**Expected Outcomes of Immersive Learning**

**Learning model foundations of immersive learning.** Although the immersive learning methodology described here is unique to BSU, the program was built upon previous learning methodologies. The methodologies that have laid the foundation for this program include experiential learning and service learning models. Immersive learning has evolved from these models, building upon their core characteristics while adding specific criteria to make immersive learning a cornerstone experience at BSU.

Experiential learning arose from Dewey’s philosophy of education. Dewey believed that there should be a relationship between the content that a student learns in the classroom and actual life experiences (Dewey, 1938) and students should engage in real-life experiences as part of the curriculum. In order for the experience to be educative, it must be continuous and interactive (Pugh, 2011). In other words, the experiences must be a purposeful part of the curriculum and through these interactions, the student is encouraged to learn more. Dewey also suggested that there needs to be reflective thinking and learning in order for the experience to hold educational value (Dewey & Boydston, 1981; Miettinen, 2000) for the student. Since students enter into these experiences with their own diverse backgrounds, the path to their knowledge is uniquely their own. According to Blenkinsop and Beeman (2012), students who engage in experiential learning experiences are led down a path to more advanced problem-solving methods as part of this engagement.

Experiential Learning Theory (ELT) is a more contemporary model that has emerged and evolved from Dewey’s work. ELT holds a basic assumption that ideas are not fixed, but are
formed and re-formed through experience (Kolb & Fry, 1975). In ELT, students engage in a cyclical learning experience where they move from concrete experiences, reflective observations, abstract conceptualization, and active experimentation. Core concepts of the model suggest that students engage in grasping experiences as they move from concrete experiences to abstract conceptualizations and the students, through this process, incur emotional responses. Students engage in transforming experiences as they move from active experimentation to reflective observations, and consequently students experience cognitive responses. As students engage in these grasping and transforming experiences, knowledge is formed (Kolb, 1984). Indeed, ideas are not fixed, but formed through these experiences. These experiences must be meaningful to the students, and the students must reflect on their experiences to benefit from them (Kolb & Kolb, 2009).

Service learning models also have contributed to the key concepts of immersive learning. Service learning models address both the personal and academic goals of the students with the communities’ goals of increasing civic engagement and social justice. These models are built upon traditional learning models but differ in their intentions to service both students and the recipients of the service equally (Sigmon & Pelletier, 1996). Characteristics of service learning models include meaningful service, sufficient duration and training, strong connection between curriculum and service activities, student leadership, community involvement, diversity, and critical reflection (Giles & Eyler, 1994; Henrich & Anderson, 2014). Service learning models have been researched to investigate their effectiveness. These models have been linked to positive effects on students’ personal and interpersonal development including higher scores on civic action, leadership skills, problem-solving skills, and social justice attitudes (Eyler & Giles, 1999; Moely, Mercer, Ilustre, Miron, & McFarland, 2002; Simons & Clearly, 2006;).
positive student attitudes towards themselves and the community after a semester (Boyle-Baise & Kilbane, 2000); enhanced multicultural competencies and community involvement (Rockqeumore & Schaffer, 2000; Root, Callahan, & Sepanski, 2002); and greater levels of community engagement, academic engagement, and interpersonal engagement for service learners compared to nonservice learners (Gallini & Moely, 2003).

Through the merger of both experiential learning models and service learning models, immersive learning emerged as a learning model utilized by BSU. The fundamental characteristics of immersive learning, including focusing on student outcomes, active learning processes, tangible outcomes or products, teams of students, and community partners have evolved from these experiential and service learning models. In addition to these fundamental characteristics, immersive learning also provides an enhanced classroom climate that is created with experiential and service learning opportunities by providing the students more engaged and meaningful learning through the integration of these fundamental characteristics. There is a strong correlation between classroom climate and students’ well-being (Rania, Siri, Bagnasco, Alea, & Sasso, 2014), and students who perceive support from their instructors and classmates report higher levels of well-being. According to Martens and Gainous (2013), instructors who foster and encourage students’ input in the classroom tend to be more fruitful as well. This contributes to classroom climate as instructors use this autonomy-supported teaching tool and “enhance classroom environment and student engagement” (Levesque-Bristol & Stanek, 2009). Essentially, immersive learning embodies the “Chinese proverb, ‘I hear, and I forget; I see, and I remember; I do, and I understand’” (Silberman, 1970, p. 216).

**Transformative outcomes of immersive learning.** Research suggests that when students engage in active learning experiences such as experiential and service learning, they
should perceive personal outcomes that include changes in motivation, self-regulation, self-identity, and learning outcomes; all of which can be subsumed under changes in self-determination. These experiences can be transformative, as prescribed by Pugh (2011), when the student “acts on the subject matter by using it in an everyday experience to more fully perceive some aspect of the world and finds meaning in doing so” (p. 111).

**Motivation.** Motivation is known to be associated with experiential learning opportunities (Darby, Longmire-Avital, Chenault, & Haglund, 2013; Levesque-Bristol & Stanek, 2009), and motivated behavior should increase when students help others, form relationships with community partners, and enjoy their experiences as they do when engaged in immersive learning experiences. Attribution theory (Weiner, 1979; 2006) posits that students are affected by environmental and personal factors and utilize three characteristics of these factors to explain their successes and failures. Emotions are associated with these factors as well. The first characteristic of students’ attributions is whether students attribute their performance to an internal or external factor, and feelings of pride and self-esteem are associated with this dimension (Weiner, 2006). The second characteristic of students’ attributions is stability, or whether causes of performance change over time. This characteristic ranges from stable to unstable, and feelings of hope or hopelessness is associated with this dimension. The last characteristic is controllability, which reflects whether an individual can control their performance. This characteristic ranges from controllable to uncontrollable, and feelings of shame and gratitude are associated with this dimension. Motivation increases when students associate their performance to internal and stable dimensions (Haugen & Lunch, 2000).

Teachers communicate attributional information to students through both oral and written feedback (Brophy, 1981). When students are engaged in immersive learning opportunities and
work very closely with their instructors, the accuracy of feedback is increased (Sadler, 1989), therefore students’ motivation to succeed should increase.

**Self-regulation.** Self-regulation explains how we model, control, and accurately evaluate our behavior, thinking, and emotions (Pintrich, 2000). Zimmerman (2002) explained a three-phase cycle in self-regulated behavior including forethought, performance, and self-regulation. When students engage in forethought, they set goals and engage in strategic planning. Students must feel self-efficacious in their beliefs to engage in this process (Zimmerman, 2002). The second phase is performance where the student maintains attention, while engaged in self-instruction and task strategies. In the final phase, the student engages in self-reflection where the student self-evaluates and makes attributions for his or her performance. Immersive learning offers students the opportunity to improve their self-regulated learning skills as their experiences are student-driven.

**Self-identity.** Self-identity is a comprehensive self-understanding, and self-identity is cemented when adolescents attempt and are able to successfully answer the question of “Who am I.” Luyckx, Klimstra, Duriez, Petegem, and Beyers (2013) stated, “establishing a strong sense of identity provides individuals with a sense of continuity and sameness, and plays favorably into psychosocial functioning” (p. 701). Erikson (1968) explained that these students are in a stage of identity versus identity confusion where they experience psychological moratorium, or a period of exploration where they are trying to engage in activities with the intent to figure out these questions. Moreover, McLean and Thorne (2003) and McLean and Pratt (2006) found that relationship, autonomy, and mortality events are important to the formation of a meaningful identity. By definition, immersive learning provides students opportunities for exploration and experimentation in terms of their self-identity. When students engage in immersive learning
opportunities, they are afforded the opportunity to explore different roles and reflect on their performance in their roles. Immersive learning experiences should allow students to experience more autonomy and relatedness due to the nature and foundation of the model, and their self-identity should be more fully realized as a result of this experience.

**Student learning outcomes.** Positive student learning outcomes also are expected from immersive learning experiences. The three R’s, known as relevancy, rigor, and relationships are present within immersive learning (Beattie, Rich, & Evans, 2015). Relevancy can include either personal relevance to the material or material that is relevant to the student’s world (Hidden Curriculum, 2014). Rigor does not only include “difficult” subject matter, but reflects instruction that is challenging enough to meet the needs of the students. Students perform better when they have personal relationships with those involved in the learning process. Immersive learning experiences meet the challenges of relevancy, rigor, and relationships in the design of the experience. Additionally, deeper critical thinking skills can emerge from opportunities to engage in immersive learning experiences. Critical thinking requires students to take the lead in applying knowledge, provide reasoning, and demonstrating deeper knowledge (Azer, Guerro, & Walsh, 2013) during these experiences. Immersive learning experiences are student-driven (Heinrich, Habron, Johnson, & Goralnik, 2015) and real-life in nature (Sedlack, Doheny, Panthofer, & Anaya, 2003), and students have opportunities to develop deeper critical thinking skills through the reflection of the decisions made during these experiences.

**Self-determination.** Motivation, self-regulation, self-identity, and learning outcomes can all be subsumed under the more comprehensive notion of self-determination. Self-determination theory reviews the relationship between students’ basic psychological needs (autonomy, competence, and relatedness), motivation (internal and external), and their self-regulated
behavior (Deci & Ryan, 1985). Students who have their needs satisfied develop effectively, their motivation becomes more internal, and their behavior more self-regulated. Specifically autonomy, competency, and relatedness are basic psychological needs that, when met through immersive-type experiences, can lead to effective functioning in the environment (Deci & Ryan, 2000), and these specific psychological needs have been found to underlie and support motivation (Faye & Sharpe, 2008; Vansteenkiste, Lens, & Deci, 2006), self-regulation (Legault & Inzlicht, 2013; Ryan & Deci, 2006), self-identity (Jones, Vaterlaus, Jackson, & Morrill, 2014; Luyckx, Vansteenkiste, Goossens, & Duriez, 2009; Mullis, Graf, & Mullis, 2009), and learning outcomes (Vansteenkiste et al., 2006; Wielenga-Meijer, Taris, Wigboldus, & Kompier, 2011).

Moreover, activities that are more autonomous for the student offer opportunities for the student to experience feelings of competency and relatedness, and their motivation becomes more self-regulated and self-determined (Vansteenkiste, et al., 2006). Immersive learning experiences, by design, should offer more opportunities for the basic psychological needs of the students to be met. Autonomy is supported through the student-driven curriculum, which is supported by faculty members. Through the experiences, students should gain increasing levels of competence as they experience success and learn from mistakes during this “real life” experience and the mentorship they receive. Additionally, as students work closely with their teams and their faculty advisor, their relatedness needs can be addressed. Therefore, it is these basic psychological needs of autonomy, competence, and relatedness that will be examined in this study. If these foundations of critical academic skills are found to be positively impacted by immersive experiences, it can be assumed that increased levels of engagement will lead to greater gains in all potential outcomes of immersive learning.

**The Present Study**
Immersive learning methodology is built upon experiential and service-learning methodologies. Theoretically, immersive learning should lead to the explained changes in self-identity, motivation, self-regulation, and deeper knowledge. Specifically autonomy, competency, and relatedness are basic psychological needs that, when met through these experiences, can lead to effective functioning in the environment (Deci & Ryan, 2000). Previous research has illustrated differences in the students’ perceived sense of autonomy, competency and relatedness (Caprara et al., 2008). However, no research has been conducted thus far on immersive learning to make these determinations or understandings of these relationships.

The Office of Immersive Learning was interested in examining the multi-dimensional characteristics of immersive learning students. To begin, basic characteristics of an immersive learning student at BSU are currently unknown. Demographic data including gender, ethnicity, and high school performance were examined to build this profile. Additionally, academic information such as college of study and academic status were included. To build this profile, archival data from 2007-2014 were utilized. By creating this profile, the Office of Immersive Learning can increase its marketing efforts to populations that currently do not engage in immersive learning experiences. Second, changes in self-determination factors (autonomy, competency, and relatedness) for students currently engaged in immersive learning experiences were explored. Theoretically, immersive learning experiences should lead to increased sense of autonomy, competence, and relatedness. As previously noted, changes in these areas can affect self-identity, motivation, self-regulation, and learning outcomes. Last, changes in self-determination factors (autonomy, competency, and relatedness) for students currently engaged in immersive learning experiences with differing levels of immersion were explored. As students
are provided more intense experiences, greater changes in perceived autonomy, competence, and relatedness would be expected due to the design and intensity of the experience.

Research Questions

1. Are there demographic differences between students who participate in immersive learning opportunities and students who did not participate (high school GPA, gender, race, college, major, and prior immersive learning experiences)?

2. Are there changes in self-determination factors (autonomy, relatedness, and competence) among students who participate in immersive learning?

3. Are there differences in changes in self-determination factors among students who participate in fully immersive classes, compared to students who participated in partially immersive experiences, and students in non-immersive traditional classes, over the course of one semester?
CHAPTER TWO

REVIEW OF LITERATURE

History of Immersive Learning at Ball State University

Virginia B. Ball was the founder of the Virginia B. Ball Center (VBC) for Creative Inquiry. Ms. Virginia Ball was a resident of Muncie, Indiana and was a supporter of both education and the humanities. She was especially supportive of the arts, and was interested in developing creative partnerships between BSU and the Muncie community in which she lived. In 2000, Joe Trimmer, an English Professor in the Honors college was approached by President John Worthen to create a proposal for a center for creative inquiry. The intent of this proposal was to present it to Ms. Ball with the goal of developing a partnership for the pursuit of creative inquiry. Ms. Ball established the Virginia B. Ball Center for this very purpose. Since her death in 2003, the center has remained active and has been supported through financial gifts from the Edmund F. and Virginia B. Ball Foundation.

The VBC supports four creative projects per year and faculty members lead students in seminars that are interdisciplinary in nature through an entire semester. In 2004, President Jo Ann Gora encouraged the development of additional immersive learning opportunities to become available for students across all of the individual colleges and departments. In addition to the semester projects supported by the VBC, she was interested in bringing immersive learning to the individual colleges and classrooms through more targeted efforts. In 2007, efforts to officially track immersive learning projects began; and between 2007 and 2014, all seven colleges and 45 academic departments had completed more than 1,500 projects. Roughly 25,000 students engaged in these immersive learning experiences that impacted the region, state, and world.
In 2015, immersive learning became part of the university’s vision for offering entrepreneurial learning opportunities for every student, including immersive learning opportunities, as part of this vision. The following learning opportunities are included on the continuum (from less impact to more impact): study abroad, service learning, capstone classes, internships/externships, practica/clinical work, community-based projects, undergraduate research/field study, and immersive learning.

**Foundations of Immersive Learning Methodology**

Although the immersive learning methodology described is unique to BSU, the program was built upon previous methodologies. The methodologies that have laid the foundation for this program include experiential learning and service learning models. Immersive learning has evolved from these methodologies and was built upon their core characteristics to make immersive learning a cornerstone experience at BSU.

**Dewey’s Experiential Learning.** John Dewey was an American psychologist and educational reformer in the twentieth century who significantly contributed to the American education system. Throughout his lifespan he promoted experiential (or problem-based) learning as a valuable tool in educational curricula. Dewey (1938) explained “there is an intimate and necessary relationship between the processes of actual experience and education” (p.7), and that progressive education should include quality, real-life experiences as part of the curriculum. However, not all experiences can be considered educative; indeed, if the particular experience is to be considered educative, the experience itself must have continuity and interaction (Pugh, 2011). Continuity of experiences is the idea that the experience must come from and lead to additional experiences based upon the content that the child is learning. These experiences are not detached from the curriculum, but in fact each experience encourages the student to learn
more. Dewey’s second component, interaction “assigns equal rights to both factors in experience- objective and internal conditions” (p.38). In order for experiences to be educative, they must meet both the content (or external conditions) and the internal need or goal of the individual student. Experiences have the potential to be mis-educative, an experience that stops or retards growth for future experiences, or non-educative in which the student has not reflected on the experience, and therefore has not grown through the experience (Pugh, 2011). Therefore, the quality of the experience is vital to the growth of the student and promotes subsequent learning experiences.

Experiential learning as a model arose from Dewey’s philosophy of education. Dewey explained that there are phases of reflective thinking and learning in which the student travels on in their quest for understanding (Dewey & Boydston, 1981; Miettinen, 2000). This model includes the following stages: disturbance and uncertainty (habit does not work); intellectualization and definition of the problem; studying the conditions of the situation and formation of a working hypothesis; reasoning; resting the hypothesis in action; and ideas or concepts which results in the solution of the problem and control of the action (Dewey, 1938). Instructors should provide opportunities for their students to embark on this path as they develop their own opinions of the content they learn in the classroom by interacting with the information (Blenkinsop & Beeman, 2012). These opportunities should include hands-on experiences and connect directly to the student’s life. This particular approach combines concrete experiences, abstract concepts, and reflection with active learning for the further development of the student (Miettinen, 2000). Experiential learning is designed to improve the student’s understanding of a topic by allowing the student the freedom to explore the content in a way in which is most beneficial for the individual student. Dewey suggested that these experiences will be
individualized due to the diversity of each student’s background experiences and knowledge; the path is uniquely their own. In addition, this particular methodology allows the classroom experience to mimic “real-life” where individuals have many different views of these topics.

Research continues to support the benefits of problem-based learning on achievement levels of students (Batdi, 2014; Sungur, Tekkaya, & Geban, 2006). Ali, Akhter, Shahzad, Sultana, & Ramzan (2011) found that when students were engaged in using problem-solving methods, those students achieved higher scores on a follow-up exam measuring math skill ability than the students engaged in traditional methods of instruction. Sungur et al., (2006) investigated students who were separated into problem-based learning and traditional instruction. The two groups were taught the same content by a singular teacher, with the difference being the instructional model. The researchers found that the group that was instructed using problem-solving methods earned statistically significant higher scores that the students taught by traditional methods.

**Kolb’s Experiential Learning.** Dewey’s original concepts and ideals of experiential learning have been utilized in more contemporary models. Once such model is the Experiential Learning Cycle, which was developed and introduced by Kolb and Fry in 1985. “It is not enough just to do, and neither is it enough just to think. Nor is it enough simply to do and think. Learning from experience must involve linking the doing and the thinking” (Gibbs, 1988, p. 9). This is one of the foundational concepts of Kolb’s Experiential Learning Theory (ELT). Kolb and Fry (1975) introduced an Experiential Learning Cycle in which the student engages in a concrete experience, observes and reflects, forms abstract concepts, and then engages in active experimentation in new situations (Figure 1).
ELT emerged from this learning cycle and describes learning as “the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience” (Kolb, 1984, p. 38). Kolb explained that “Ideas are not fixed and immutable elements of thought, but are formed and re-formed through experience” (Kolb, 1984, p. 26). In ELT, there are two dialectically related modes of grasping experiences and two dialectically related models of transforming experiences in the model. One of the dialectically related modes is on the north-south axis is labeled the Grasp Continuum. The Grasp Continuum explains our emotional responses, or our feelings about the task we have just experienced. One way those students are able to emotionally transform their experiences (in order to transform it into something meaningful) is to experience the concrete and tangible qualities of the experience, which is considered a ‘concrete’ experience or feeling. The alternative way that students are able to transform this experience is to think, analyze, and plan,
which is considered abstract conceptualization or ‘thinking.’ Therefore, the perception of grasping experiences is located on a continuum from concrete to abstract. The second dialectically related mode is situated on the east-west axis and is labeled the Transform Continuum. The Transform Continuum explains how one approaches a particular task. When students approach the task or experience, they often opt to do this in one of two ways -- through reflective observation or active experimentation. In reflective observation, the student will watch others who are involved in the experience and then reflect on those observed experiences. Alternatively, the student will engage in active experimentation where they will actively experience the activity first-hand. Therefore, the perception of transformative experiences moves from active to reflective.

Kolb (1984) noted that learning is a tension-filled and conflict-ridden process. “New knowledge, skills, or attitudes are achieved through confrontation among the four models of experiential learning” (p. 30). When students participate and engage in a particular action (concrete experience), they are in an active exploration of an experience (Kolb, 1984). It is important that the experience is meaningful to students; they must be engaged and take ownership of their learning. Students use the experience to test the idea that is presented, rather than living the experience passively. This active participation is very important, and the experience is greatly enhanced through reflection of the experience as well. The reflection (reflective observation) must reflect on the experience critically, rather than assume the experience in and of itself. Students begin to reflect how they may react in similar and/or different circumstances. Through this reflection, students are then better able to understand how the principal or concept (abstract conceptualization) may change when different actions are taken. At this point students are conceptualizing how they may generalize this experience to
other experiences. Lastly, students then apply the principal or concept into different situations (active experimentation). These new experiences become deeper and broader (Kolb & Kolb, 2009), and they continually spiral as they promote higher-level learning and are generalized to other contexts.

Experiential learning is a cyclical process in which the instructor continually and consistently offers the students opportunities to engage in and reflect upon those experiences through this cyclical approach. Students are situated in the middle of this cycle, and experience each of these four components on an ongoing basis. From this vantage, their learning is expanded. As students follow the recursive cycle of experiencing, reflecting, thinking, and acting during experiential learning, this increases their learning power (Kolb & Kolb, 2009).

The experiential learning model varies from traditional teaching models where students merely study concepts rather than experience the concept first-hand (Hursh & Borzak, 1979). These subjective experiences are interjected into the learning environment and distinguish experiential learning from other cognitive and behavioral learning theories (Kolb, Boyatzis, & Mainemelis, 2000). The students’ reflections are assimilated into abstract concepts so new implications can be drawn. As these inferences are tested, they become the foundation for creating new experiences. Students are essentially “learning how to learn” during this spiraling experience, and therefore experiential learning is highly interdisciplinary in nature and can be applied to a variety of different fields. “Learners can better understand the learning process, themselves as learners, and the appropriate use of learning strategies based on the learning task and environment” (Kolb & Kolb, 2009).

Experiential learning as a methodology has evolved into service learning models. As educators became interested in ways in which to address both the personal and academic goals of
students with the communities’ goals of increased civic engagement and social justice (Campus Compact, 2000; Eyler, 2002) these service models emerged. Eyler (2002) suggested that service-learning also allows students to feel a “connectedness” while engaged in experiential learning so they may better prepare to be lifelong learners and participate more fully in their learning processes. Through service learning, students are afforded rich opportunities to bond with their peers, their faculty members, and the community at large (Eyler & Giles, 1999). Through their participation in service-learning opportunities, the content of the disconnected disciplines that are addressed in individual classes are merged together as they apply their learning to a real-world environment.

**Service-learning.** Service-learning has been identified as a high-impact practice in education (Kuh & Schneider, 2008). Jacoby (1996) defined service-learning as “a form of experiential education in which students engage in activities that address human and community needs together with structured opportunities intentionally designed to promote student learning and development” (p. 5). Campus Compact, a national organization that was formed to encourage and support service learning and community engagement, is comprised of over 1,100 institutions. Currently, American college students are engaging in service-learning models in record numbers (Seider, Rabinowicz, & Gillmor, 2012). Service-learning pedagogy can be distinguished from traditional modes of learning through common characteristics that service-learning shares (Giles & Eyler, 1994; Henrich & Anderson, 2014). These characteristics include meaningful service, sufficient duration and intensity, strong connections between the curriculum and service activities, student leadership, community involvement, diversity, and critical reflection.
**Meaningful service.** Service-learning must be considered meaningful, real, and positive to the students who engage in this methodology (Henrichs & Anderson, 2014). When students are engaged in these experiences, they are able to recognize the positive consequences that the activity has on the environment it serves. The students are able to experience, first hand, the difference that they can make on individuals or their communities at large. Meaningful action “makes people feel like what they did made a difference in a measureable way and that their time was utilized well” (Campus Outreach Opportunity League, 1999). Education is enhanced when the course material is merged with the personal, meaningful experiences of the students (Dewey, 1997).

**Sufficient duration and intensity.** Service-learning must last long enough for the participants to achieve the goals set forth by both the students and the community partner. By allowing sufficient time to engage in the activity or experience the students are allowed the opportunity to gain knowledge of the specific context of the activity and to dig deeper into the community challenges. Through service-learning opportunities, the students are prepared to acquire and utilize critical thinking skills. These changes do not occur overnight, and sufficient time must be given to see both changes in attitudes in both the students and their community partners. Henrichs and Anderson (2014) explained that many students decide to continue to volunteer with the community partners following the conclusion of the service-learning opportunity.

**Strong connection between the curriculum and service activities.** Effective service-learning models should incorporate a partnership between both the learning institution and the community, and students have expressed that they gain deeper appreciation of the class content as a result of completing service-learning projects for their classes (Sheafer, 2014). Bringle and
Hatcher (1999) explained that faculty members are charged with merging the service-learning experience with the course objectives and the community agency personnel to ensure that the experiences students will be engaged in are in line with the goals of the institution. When students are presented material in the classroom by a faculty member, or assigned textbook readings regarding theory or content, the students will view the material as informational (Sheafer, 2014). In other words, the material will not have personal or contemporary relevance to the student. However, by engaging the students in service-learning opportunities that reflect the content of the course, students make the connection between content and their experience, thus strengthening their learning of that material.

Conway, Amel, and Gerwien (2009) engaged in a meta-analysis to review the effects of service-learning on academic, personal, social, and citizenship outcomes. The study found positive changes for all types of outcomes, specifically moderate changes for academic outcomes and small changes for personal and citizen outcomes. The researchers found programs that included a structured reflection outcome showed larger changes and effects, and recommended that faculty members consider exactly which academic and/or learning outcomes were essential to target first, and then to design and tailor the service-learning opportunities to meet the needs of those learning outcomes.

**Student leadership.** Student must engage in opportunities to “play a role in designing projects and make meaningful decisions regarding their implementation” (Henrich & Anderson, 2014, p. 26). This leadership may take several different forms, from selecting community partners the students may be previously connected with to designing programs. Lester, Tomkovick, Wells, Flunker, and Kickul (2005) found that emphasizing job characteristics that
are necessary and highlighted in the work done through service-learning leads to the development of leadership skills.

**Community involvement.** Collaboration between institutions and students is a crucial component to achieving success in service-learning (Gajda, 2004; Frey, Lohmeier, Lee, & Tollefson, 2006). Service learning connects students with community organizations “with the idea that the students, by contributing their time and effort, can help these organizations accomplish goals that would not be possible without these students’ resources and dedication” (Lester, 2015, p. 281). Therefore, this experience becomes mutually beneficial to both the participant and the community members.

**Diversity.** Diverse populations should be served through service learning models. By providing students the opportunity to interact with diverse populations, students experience changing views of social service clients through their exposure to a variety of individuals. In a study conducted by Giles and Eyler (1994), they found that students who participated in service-learning models with diverse populations experienced a change in their preconceptions of the population that they were working with. The students experienced more empathy for their clients through this exposure. One theme that was found was “they (the people being served) are just like anyone else” (p. 334). Through experiences with diverse populations, the students explained that they were more likely to attribute unfortunate circumstances of their clients to circumstances that were beyond the clients’ control. Additionally, the students indicated they were significantly more likely to endorse additional support to meet the populations’ needs than they had before their service learning experience. Diverse population may include a variety of characteristics, including racially diverse populations and economically diverse populations.
**Critical reflection.** Critical reflection for service-learning models is extremely important and should be purposeful in the methodological planning of the experience. Eyler (2002) suggested that critical reflection should occur prior to the experience, during the experience, and at the conclusion of the experience. Additionally, these reflections should occur individually, with classmates, and with community partners. Eyler (2001) provided examples of activities that promote purposeful reflections (see Figure 2).

<table>
<thead>
<tr>
<th></th>
<th>Prior to experience</th>
<th>During experience</th>
<th>After experience</th>
</tr>
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<tbody>
<tr>
<td>**Individual</td>
<td>Letter to self; goal statement</td>
<td>Reflective journal</td>
<td>Individual paper, film, artwork</td>
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<tr>
<td>reflection**</td>
<td></td>
<td></td>
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<tr>
<td><strong>Class reflection</strong></td>
<td>Explore “hopes and fears;” contrast expert views</td>
<td>List-serve discussions; critical incident analysis</td>
<td>Team presentation</td>
</tr>
<tr>
<td>**Community</td>
<td>Create contact; needs assessment</td>
<td>“Lessons learned;” on site debriefing</td>
<td>Presentation to community partner</td>
</tr>
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*Figure 2. Mapping Service-Learning Reflection Activities*

These reflective activities assist students in monitoring their own learning as well. By creating goals prior to the learning experience, the student is able to use reflection to monitor their progress on meeting these learning goals (Eyler, 2002). Through participation in reflective activities, the student is directed to new ways to review the events that have taken place (Bringle & Hatcher, 1999). According to Sheafer (2014), “Service learning works because it supports the construction of knowledge through student reflection on experience, development of new conceptualizations, and experimenting with the new conceptualizations” (p.78).

Additionally, Brownell and Swaner (2009) identified three specific factors that need to be considered when looking at service-learning. Students must interact directly with clients, receive
regular feedback regarding their progress during the experience, and the experience should be long enough to be meaningful and allow the student to develop relationships between the student and the client that they serve. Service-learning allows the student the opportunity to engage with life experiences that are different than their own (Hildenbrand & Schultz, 2015). Students who work with youth may feel as though they have engaged in worthwhile and meaningful service (Seider et al., 2012), and service-learning correlates with positive cognitive and personal outcomes (Sheafer, 2014), as well as active and collaborative learning (Kilgo, Ezell-Sheets, & Pascarella, 2015).

In a study conducted by Hursh and Borzak (1979), the researchers found that students engaged in a service-learning experience learned much more about themselves than was expected. The participants reported an expanded self-concept and identity, as well as an increase in the dimension of power or autonomy. The study also indicated that students reported that they experienced an increased appreciation for the perceptions of others, and how conflicting perspectives can occur within the “real-world.” One particular student worked in the Office of the Public Defender in her experience, and she noted that the question of guilty or not guilty is a more complex issue than she had originally believed. In another study by Driscoll, Holland, Gelmon, and Kerrigan (1996), four service-learning courses were utilized to determine if service-learning would have a positive impact on students. The study found that service-learning affected students in their awareness and involvement in the community, personal development, academic achievement, and sensitivity to diversity. This supports Kolb’s cycle that “reflective observation can lead to the formation of abstract concepts and to the testing of such concepts in new situations” (p. 70). Regarding the link between theory and practice, this study illustrated that students were able to link the theory and practice only at the end of the experience, when
they completed their final projects. This was a specified outcome at the beginning of the program, and once again speaks to the operationalization of Kolb’s model. Students in this study reported that they learned to take initiative, responsibility for themselves, to be more autonomous, and in some cases, to establish friendships. Relatedness needs were met during this experience for the participants. The study results made note of an important aspect of this particular program; there was an academic component to the service learning experience that was on site for the students to participate in. The academic component allowed the student to engage in a continuous traditional academic experience and not have the internship interrupted. However, as part of this component, the researchers believed that the students may have experienced role confusion as they moved between the student and paraprofessional role (Driscoll et al., 1996). Students who achieved the reconciliation of the roles gained an increase in self-confidence in both of those roles.

There have been relatively few attempts to measure the quality of service-learning experiences. However, those that have explored this methodology indicate that the quality of the experience is important, especially with regards to the type and amount of reflection the individual student engages in (Eyler & Giles, 1999; Mabry, 1998).

**Immersive learning.** The merger of experiential learning and service-learning models has evolved into an immersive learning methodology. The creation of immersive learning allows students to embark on experiences that are both hands-on and meaningful in nature. These experiences can lead the student down the path to positive personal outcomes, such as increases in self-identity, motivation, self-regulation and learning outcomes. As Confucius (circa 450 BC) is reputed to have offered, “Tell me and I will forget; show me, and I may remember; involve me, and I will understand.”
Within immersive learning models, it is important to consider the classroom climate. Teachers have a great deal of influence over their students as they design and foster all aspects of the classroom, including but not limited to the emotional and physical aspects of the classroom environment. Teachers have significant influence over their growth, behavior, and well-being of their students. When students perceive their teachers to be kind, supportive and helpful, behaviors in the classroom are associated with higher academic achievement, gains in student motivation, and positive peer relationships (Berk, 2012). In a study of 278 high school students, the researchers examined teacher practices and how they related to student autonomy and course value (Patall, Dent, Oyer, & Wynn, 2013). Teachers who provided more opportunities for students to engage in perspective-taking activities and provided students greater choices in the classroom environment related to students’ greater autonomy need satisfaction. Additionally, students believed that when their course instructor identified and explained the value of the coursework, considered the interests and the thoughts of the students in the course activities, this autonomy need satisfaction was even further fulfilled. These perspective-taking activities and self-direction are enhanced through immersive learning experiences as the students work together with their community partners and are engaged in student-driven activities.

A study conducted with younger, middle school students found that at the personal level, responsible civic behavior was positively associated with perceptions of both student-teacher relationships and student relationships (Geller, Voight, Wegman, & Nation, 2013). In another study of college students, the researchers found that this methodology supports classroom autonomy and can enhance not only the classroom environment, but student engagement as well (Levesque-Bristol & Stanek, 2009). Instructors can contribute to the classroom climate within
Immersive learning experience through their support of their students as they embark on and engage in these experiences.

Immersive learning has many important ramifications. There are significant personal outcomes, social outcomes, and learning outcomes that result from immersive learning experiences. Understanding the many underlying theoretical assumptions will help to identify the specific personal and learning outcomes that may result from immersive learning.

**Self Determination Theory**

Deci and Ryan (1985) introduced Self-Determination Theory (SDT), a theory of human motivation that focuses upon the process of how an individual internalizes goals and values (Deci & Ryan, 2000; Karaarsian, Ertepinar, & Sungur, 2013). SDT is an organismic approach that begins with the assumption that people are active organisms with tendencies to grow, overcome challenges, and integrate new experiences into a concrete sense of self (Deci & Ryan, 2000). Although these tendencies are developmental and natural, they do require social supports to develop fully. The social environment can both support these tendencies and suppress them; therefore, it is the interaction between the active organism and the social context that is the basis for SDT’s predictions about behavioral, experiential, and developmental outcomes. SDT utilizes these social supports to meet the basic psychological needs for autonomy, competence, and relatedness. Those who have their needs satisfied develop and function effectively in their environment, whereas those who do not have these needs met suffer from ineffective functioning (Deci & Ryan, 2000).

SDT, as it applies to education, is concerned with promoting in students an interest in learning, the value of education, and building confidence in the student's own attributions and capacities (Deci, Vallerand, Pelletier, & Ryan, 1991). These outcomes are manifested in
students being internally motivated, and displaying internal values and self-regulatory processes. These processes can result in higher-level learning, including greater depth of conceptual understanding and enhancement of students’ personal growth and adjustment. Following are the many characteristics of self-determination.

**Motivation.** Intention is often found as the root of motivation (Deci et al., 1991), and it is the impetus of our behavior. SDT posits that motivation moves along a spectrum with no motivation on one side of the spectrum (amotivation) to intrinsic motivation on the other side of the spectrum (Deci & Ryan, 2000). Individuals vary in the types and level of motivation they possess for tasks and challenges they are confronted with. SDT distinguishes between extrinsic and intrinsic types of motivation based upon the reason that one chooses to engage in an action. The most basic distinction is between intrinsic motivation (doing something because it is inherently interesting, enjoyable, or from the satisfaction received from engaging in the task) (Deci & Ryan, 2000) and extrinsic motivation (engaging in a behavior because it leads to a particular outcome). Students who are intrinsically motivated act according to their personal interests and choices (Pelletier, Tuson, Green-Demers, Noels, & Beaton, 1998). However, externally motivated behaviors are promoted by external rewards or consequences (Ryan & Deci, 2000).

There is considerable research to support intrinsic motivation as an important phenomenon for educators (Cerasoli, Nicklin, & Ford, 2014), and learning and achievement can be promoted or undermined by these teaching practices (Vansteenkiste et al., 2006). Extrinsic motivation is less powerful than intrinsic motivation, and while some forms of extrinsic motivation can be weak, others can represent active, agentic states. Although intrinsic
motivation is more powerful than extrinsic motivation, educators cannot always rely upon
intrinsic motivation to foster the learning of students.

Intrinsic motivation has been observed with animal studies as animals engage in
spontaneous behavior for the fun of the activity (Deci & Ryan, 2000); they do not require
extrinsic incentives to engage in all behavior. These natural motivations are important because
we act upon our own inherent interests as we grow in knowledge and skills. Deci, Koestner, and
Ryan (2001) suggests that intrinsic motivation focuses upon our innate, psychological needs for
competence, autonomy, and relatedness.

Research has been conducted to determine which social conditions enhance and which
conditions diminish internal motivation, evolving into Cognitive Evaluation Theory (CET)- a
sub-theory of SDT (Deci & Ryan, 1980). CET explains that events and structures that result in
feelings of competence during an action can increase the internal motivation for that action
because the need for competence is being met. Therefore appropriate challenges, effectual
feedback, and positive, constructive evaluations promote internal motivation. However, these
feelings of competence must be accompanied by a sense of autonomy or internal perceived locus
of control. Extrinsic rewards can undermine internal motivation because the individual moves
from an internal to external perceived locus of causality. Performance feedback increases
internal motivation (Guo, Liao, Liao, & Zhang, 2014) and negative feedback diminishes it, but
perceived competence can mediate these effects. There is also research to support that extrinsic
rewards can undermine internal motivation (Deci, Koestner, & Ryan, 1999; Lepper, Henderlong,
& Gingras, 1999; Tang & Hall, 1995) because students move from an internal to external
perceived locus of causality as external rewards are bestowed upon the students.

Extrinsic motivation is of particular interest for educators due to the demands placed on
students that are not inherently interesting or internally motivating, and internal motivation can often diminish when students are faced with social demands. SDT explains that extrinsic motivation exists on a spectrum as well, varying in the degrees in which the activity is autonomous. For example, does the student do their homework because they want to avoid punishment or because there is an instrumental value in doing the work? Education systems are described as fostering the internalization (individuals take in the value or regulation—moving from unwillingness to active personal commitment) because with higher degrees of internalization comes more persistence for an activity with positive self-perceptions. When this occurs, there is an integration of values and behavioral regulations will follow. Another sub-theory of SDT is the Organismic Integration Theory (OIT), which explains the different forms of extrinsic motivation and the factors that can either promote or hinder the internalization and integration of the regulation. The following continuum is described by OIT: integrated regulation, identification, introjected regulation, external regulation, and amotivation. The process of internalization is developmentally important, but it does not exist on a typical developmental continuum. For example, a student can begin an activity believing that there is inherent value in the activity, but then move to amotivation, etc. A specific sequence does not exist in SDT, but it is developmental in that as cognition develops, behaviors and values that can be assimilated to the self increase, and regulatory styles become more internalized over time with general tendencies toward autonomy and self-regulation over time.

Locus of causality. SDT posits that the degree to which the student controls the student’s behavior internally correlates with the student’s perceived locus of causality. If a student perceives the locus of control to be internal, the behavior that results will be self-determined. If a student perceives the locus of control to be external, the behavior that results
will be controlled by outside influences. Although both self-determined and controlled behaviors can be both intentional and motivated, the processes that regulate them are different. Additionally, both the quality of the behavioral and experiential components can be different as well (Deci et al., 1991).

**Self-regulation.** SDT suggests that there is a difference between self-determined and controlled types of self-regulation; motivated actions are self-determined in that they are engaged in volition and endorsed by one's sense of self (Deci & Ryan, 1994; Deci et al., 1991). The needs for competency, autonomy, and relatedness are what drive students to engage in behavior as they seek to fulfill these needs. The social context is necessary for this to occur, and the behavior of the student exists on a continuum between non-self-determined and self-determined behavior. Regulation of the behavior is based upon the motivation of the student within the particular context. The self-determination of behavior, locus of control of motivation, and regulation are processes that run parallel to one another and can be described using the following continuum:

**Internally regulated behavior.** Internally regulated behavior occurs when the student is internally motivated by inherent interest in doing the activity. The student finds enjoyment by doing the activity in and of itself, and the behavior that follows is self-determined by the individual student.

**Integrated regulated behavior.** Integrated regulation of behavior occurs when the student experiences external motivation and the interest in the activity is due to the congruence of the activity to his/her value system. Although the student does not inherently experience pleasure by engaging in the activity, the student is happy to behave in that manner (Ryan, 1995). In other words, although the identified regulations have been assimilated to the self, they are still
separate from the behavior.

**Identified regulated behavior.** Identified regulation of behavior occurs when the student has identified with the personal importance of the behavior and has accepted the regulation independently because the student sees the value of the activity itself. The student attributes values to the behavior while accepting it as personally important (Deci et al., 1991; Deci & Ryan, 2004; Karaarsian et al., 2013). The motivation behind the behavior is still categorized as extrinsic since the behavior is undertaken because of its perceived usefulness and importance (Deci et al., 1991) rather than the inherent value the student possesses for the activity.

**Introjected regulation.** The student’s interest in a particular activity is due to extrinsic rewards. These rewards are not necessarily tangible, but can include the attainment of ego-enhancement or pride in the activity to performing the activity to avoid guilt. Introjected regulation represents those behaviors that are regulated by the contingent self-esteem that results from the behavior (Ryan & Deci, 2000).

**External regulation.** External regulation occurs when the student’s interest in the activity is due to external consequences and it is considered the least self-determined form of extrinsic motivation. These consequences can include satisfying a demand from others, receiving an external reward contingent on a particular behavior, or avoiding punishment.

**Amotivation.** Amotivation occurs when the student lacks any intention to act because the student does not value the activity, has feelings of incompetence, or the activity lacks any desired outcome. The student does not want to be an active participant in the activity because he/she sees little worth in the activity (Ryan, 1995).

**Social influences.** Educational environments represent a significant social influence on students. Those institutions make a tremendous impact on the course of a student life, which can
then impact society. "Ideal school systems are ones that succeed in promoting in students a genuine enthusiasm for learning and accomplishment and a sense of volitional involvement in the educational enterprise" (Deci et al., 1991, p. 325). According to Ramsing and Sibthorp (2008) individuals who are in leadership roles or “one-up” authoritarian positions (Sheldon, Williams, & Joiner, 2003) can provide autonomy support to individuals. This support is often found by providing students choices, and the support allows for rationale provisions and perspective-taking opportunities.

**Basic psychological needs.** Most motivational theories focus on goals of the individual and address the process in which the individual moves in order to obtain their goals. SDT explains that individuals set goals (referred to as the energization of behavior) in order to meet their basic psychological needs (Deci et al., 1991). SDT accomplishes this task by addressing three basic, foundational needs that are inherent in individuals. These inherent needs are the need for autonomy, the need for competence, and the need for relatedness.

It is vital to address psychological needs when discussing motivation for several different reasons (Deci et al., 1991). By addressing these psychological needs, it provides an opportunity to discuss whether there are motivational universals in individuals. It also allows provides an opportunity to incorporate a range of phenomena that individuals may experience together, whereas they may not appear to be connected otherwise. Additionally, it provides an opportunity to determine which specific conditions will facilitate the motivation, performance and development of those individuals. In other words, “motivation, performance, and development will be maximized within social contexts that provide people the opportunity” (Deci et al., 1991, p. 327) to fulfill those needs.

**Autonomy.** In SDT, autonomy refers to students’ desire to make their own choices, to
initiate their own behavior, and to behave in accordance with their own interests (Vandercammen, Hofmans, & Theuns, 2014). Individuals have an innate desire to self-initiate and regulate their own actions so they can feel in control of their own behaviors and actions (Deci & Ryan, 1980). When students perceive that they possess an internal locus of causality (they are in control of their behavior and efforts), their need for autonomy is being met. Therefore, when students perceive they have greater control of their classroom activities and directives, their need for autonomy is being fulfilled and the student becomes more self-determined in their behavior (Deci, Schwartz, Sheinman, & Ryan, 1981; Ryan & Grolnick, 1986).

**Competency.** In SDT, Deci and Ryan (2000) defined self-efficacy as the perceived competence an individual possesses. As students feel that they are more competent in their abilities, their need for feelings of competency is being fulfilled and they are more self-determined in their behavior. Students benefit from having opportunities to display and experience success, thus meeting their need for competency.

**Relatedness.** As students feel like they are engaged with others, their need for relatedness is being fulfilled and they become more self-determined in their behavior. Steinberg, Dornbusch, and Brown (1992) explained that school peers are influential on students’ behavior, including how much students enjoy coming to school. When students perceive relatedness with others, their behavior becomes more self-determined. Additionally, students can experience feelings of relatedness to tasks that are perceived as relevant to the individual student.

**SDT and learning.** When students have interest and a strong will, they become more flexible and competent in problem solving, are more efficient in their knowledge acquisition, and have a stronger sense of personal worth. (Deci et al., 1991). Schools promote learning outcomes
that require students to have factual knowledge, understand the relationships among these facts, and possess the ability to find or generate their own facts when necessary. Likewise, optimal adjustment requires that students have a positive self-worth and can willfully satisfy their own needs as they are concerned about their social environment. Complying with the social demands of others is not enough and can be counterproductive to the students’ personal and social development (Deci et al., 1991).

Learning and adjustment outcomes that are promoted in school are not the same construct, but they are complimentary to one another when the schools promote certain types of motivation in their students (Deci et al., 1991). When reviewing the literature on motivation, intention is often found as the root of motivation. SDT suggests that there is a difference between self-determined and controlled types of self-regulation; motivated actions are self-determined in that they are engaged in volition and endorsed by one's sense of self (Deci & Ryan, 1990; Deci et al., 1991). Although intrinsic motivation is identified as the most powerful, it does not always fit in the realm of educational systems. Indeed, some students will not find particular subjects or activities inherently motivating. Extrinsic motivation may be more pliable for teachers to mold as they offer activities to students that can better meet their competency, autonomy, and relatedness needs. Although the goal of intrinsic motivation may not be reached, behavior may be more determined as the student moves along the continuum.

Immersive learning opportunities should allow for increases in motivated behavior. As students engage in experiences that allow for more autonomy and increased relatedness to their classmates, as per the design of the experience, their basic psychological needs are being met and students should experience an increase in motivated behavior. Likewise, as students experience success in these experiences, as measured by the perception of the student on the impact on the
community partner and participants, they will experience feelings of competence. This, too, will lead to increases in motivated behavior.

Motivation Theory.

Motivation is a theoretical construct that is employed to explain the behavior of individuals. Motivation can be defined as the reason one is directed to engage in a particular behavior, or why the individual will repeat certain behaviors. Motivation can represent the reason for an individuals’ behaviors, wants, and needs. Although motivation has been explored by a variety of theorists, attribution theory, goal orientation theory, and self-determination theory will be explored as a background to motivation in the educational setting.

Attribution theory. Attribution Theory (AT) (Weiner, 1985) incorporates basic assumptions about learning. One of these assumptions is that students are affected by both environmental factors (characteristics of the child’s home or school) and personal factors (prior experiences and prior knowledge). AT emphasizes that students are strongly motivated by the pleasant outcome of being able to feel good about themselves. AT explains that a student’s current self-perceptions will strongly influence the ways in which they will interpret the success or failure of their current efforts and their future tendency to perform these same behaviors. The explanations that people make to explain success or failure can be analyzed in three dimensions: locus including internal versus external origins, stable versus unstable, and controllable versus uncontrollable. The locus dimension explains that students succeed or fail based upon internal factors within the student (i.e., student’s ability) or external factors (i.e., the difficulty of the class). The stability dimension refers to whether the cause is stable or unstable. If students believe a cause is stable, the outcome will be the same if they perform similar behaviors on additional occasions. For example, if a student believes that they failed an exam due to lack of
ability, she or he believes that this will continue to occur again because it is a stable dimension. If the student believes the cause is unstable, the outcome is likely to be different on another, separate occasion. Specifically, if a student took an exam and she or he was ill the night before, the outcome may be different the next time the child takes an exam. The controllable dimension refers to whether the student believes the cause of the event is perceived as one in which the student has control over. If a student fails a test and perceives this to be because of lack of studying, the cause would be considered controllable. However, if a student fails a test due to perceived lack of inherent ability, the cause would be considered uncontrollable.

AT also aligns emotional responses in association with causal dimensions (Weiner, 2006). The locus dimension is associated with feelings of pride and self-esteem. If the student believes that success is attributed to an internal characteristic, he or she will feel pride in their accomplishments. The stability dimension is related to feelings of hopefulness or hopelessness; if the student feels the failure is attributed to stable causes, he or she may experience feelings of hopelessness because they would expect the same outcome regardless of their behavior. The controllability dimension is related to feelings of shame, guilt, anger, gratitude, and pity. If the student believes their success is due to a controllable cause (such as their studying for a test), he or she may experience feelings of joy. If they believe their failure is due to an uncontrollable cause (such as lack of ability), he or she may experience feelings of shame. Emotional consequences of attributions are important to consider as they ultimately affect a student's subsequent motivation to engage in particular behaviors (Weiner, 2006). These psychological processes lead to behavioral consequences where a student may decide to enroll (or not enroll) in a particular class based upon what they have attributed their success (or failure) in prior courses of that nature.
Both expectancy beliefs and emotions that students experience from the attributional processes can determine future behaviors. Academic achievement is improved and enhanced when students attribute outcomes to effort and studying, and academic achievement is thwarted when students attribute outcomes to lack of ability or luck (Weiner, 1979). In a study by Uguak, Elias, Uli, and Suandi (2007), “the results of correlation analysis indicated that the relationship between locus of control towards academic achievement satisfaction was significant \( r = 0.52, p = 0.0001 \)” (p. 125). It is important to note that if a student fails an exam due to perceived lack of studying (or internal locus of control), the student may be motivated to study harder the second time around. If the student fails an exam due to perceived lack of ability (or external locus of control), he or she may not exert the effort the second time around. Additionally, attributional information is communicated to learners in many ways (Brophy, 1981). Teachers communicate this information to their students through feedback (both in written and oral forms) and it is important for teachers to be specific in the feedback that they give to their students (Sadler, 1989). When teachers suspect that failure may be attributed to lack of effort on behalf of the student, it is important to communicate that to the student. Likewise, it is important for teachers to differentiate in their feedback. If particular strategies are helpful and useful to maximize the student’s effort, this needs to be communicated as well (Covington, 1992). For example, if a teacher notes that in a long division math problem the student is missing a step consistently, this should be pointed out to the student. This feedback assists the student in correcting the mistake with appropriate effort, rather than utilizing inefficient strategies (i.e., reading over the material again). When teachers communicate appropriately to the student, the students will be more motivated to increase their effort due to the internal locus of this effort.
(Brophy, 1981). However, if teachers do not give appropriate feedback, students may substitute the teachers “lack of effort” comments for “lack of ability.”

**Goal orientation theory.** Goal orientation theory is a social-cognitive theory of academic motivation and primarily examines why students engage in their work. Goals are divided into two major classes, mastery-oriented goals and performance-oriented goals (Pintrich, 2000). Mastery-oriented goals are developed when students are concerned about understanding and mastering new material, are interested in self-improvements, and compare their current level of achievement to their past levels of achievement (Ames, 1992; Dweck & Leggett, 1988). Essentially, students approach the learning situation in order to acquire new skills (Dweck, 1986). Mastery-oriented goal structures lead students to seek challenges if they believe the challenges will lead to increased competence and they respond to failure by increasing their efforts. Performance-oriented goals are developed when students are interested in competition with others, demonstrating their competence (rather than understanding), outperforming others, and use their peers as points of comparison (Ames, 1992; Dweck & Leggett, 1988). In other words, students approach the learning situation with the goal of gaining approval from their teachers and peers. Performance-oriented goal structures can lead students to avoid challenges unless they are certain they can succeed, and they respond to failure with feelings of self-handicapping and learned helplessness (Fadlelmula, 2010).

Mastery-oriented and performance-oriented goals can be further divided into approach and avoidance goals (Middleton & Midgley, 1997). Mastery-approach-oriented students are interested in mastering the material in an academic task; they want to understand the material. Mastery-avoidance-oriented students are interested in avoiding misunderstanding of the task. In other words, those students are more concerned about avoiding mistakes in their understanding.
Performance-approach-oriented students are interested in demonstrating their competence over their peers, and in a study conducted by Middleton & Midgley (1997), the researchers found that performance-avoidance goals negatively predicted academic efficacy. However, these goals are not mutually exclusive; students can hold onto both types of goals simultaneously. For example, a student may really want to learn the geometry concepts because he or she wants to pursue a career in architecture, and is simultaneously concerned with appearing more competent than his or her peers.

Goals can be conceptualized at differing organizational levels (Fadlelmula, 2010). Personal goals include students’ individual goals for themselves. In contrast, classroom goal structures can refer to the student’s beliefs about the goals that are emphasized by their teachers in the classroom. However, the approach-avoid distinction does not exist with classroom goal structures. When students believe that their teachers are interested in their learning, mastering the material, and performing to their personal best, they perceive that the teacher has adopted a mastery goal structure. When students believe that their classroom environment is competitive and the teacher has placed an emphasis on grades, they perceive that the teacher has adopted a performance goal structure. This can be applied to schools as well. Highly competitive schools are perceived as adopting a performance goal structure and more collaborative schools are perceived as adopting a mastery goal structure. Dweck (1999) designed a measure to investigate student’s goal orientations across a variety of domains, while other researchers have developed measures to investigate goal orientations in terms of how students feel about learning (Nicholls, Chueng, Lauer, & Pataschnick, 1989).

The literature regarding students who adopt higher levels of performance-approach goal structures is mixed, including results that show these children are more likely to earn higher
grades but are less likely to have interest in the subject matter. In contrast, those students who adopt mastery-oriented goal structures tend to have greater interest in the material. Mastery-oriented goal structures have also been correlated with higher levels of self-efficacy, positive attitudes toward the task and the self, asking for help from peers, persisting longer on difficult tasks, and using metacognitive and self-regulation strategies (Fadlelmula, 2010). Immersive learning experiences are indicative of mastery-goal orientations as students work collaboratively with their peers toward common goals, and for the improvement of their communities.

**Self-Regulation**

Self-regulation refers to the student’s ability to model, control, and accurately evaluate their behavior, thinking, and emotions. Pintrich (2000) stated that students that engage in self-regulation “set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behavior, guided and constrained by their goals and contextual features of the environment” (p. 453). Students manage all the components of motivation as they employ specific strategies to structure their environment in an effort to improve their learning and monitor their progress (Driscoll, 2005).

Pintrich (2000) defined four assumptions about self-regulation. First, students must be active in the learning experiences. Students do not passively consume information; they are actively involved in finding strategies, goals, and meaning in their learning. Second, students can monitor and influence their actions. There can be limitations placed on the student regarding individual differences and contexts, but students do have control over these actions. Third, students compare their performance to a goal or standard. Students will use this comparison to make changes in their behavior as necessary. Last, students use their self-regulation processes to
explain the influence of outside factors and personal characteristics to improve their performance (Lapan, Kardash, & Turner, 2002).

Zimmerman (2002) developed a three-phase cycle to describe and understand the role of self-regulation in learning (Figure 3). The three phases in this cycle include forethought, performance or volitional control, and self-reflection.

**Figure 3. Phases and Subprocesses of Self-Regulation (Zimmerman, 2002, p.67)**

**Forethought.** The forethought stage precedes the actual performance of the student and includes the processes that students engage in to set the environment for self-regulated learning. In this stage students set learning goals, and engage in strategic planning in order to obtain those goals. Lapan et al., (2002), explained that students “have the declarative knowledge to know about specific learning strategies, and the conditional/metacognitive knowledge to know the conditions and contexts when these strategies should be used” (p.258). At this stage, the student
also holds a sense of self-efficacy for achieving those goals. Students who feel self-efficacious about their skills and their abilities to employ these skills are more motivated to learn in a self-regulated manner (Zimmerman, 2002). This stage is considered the most important of these processes (Williams & Hellman, 2004).

**Performance or volitional control.** The performance or volitional control stage includes processes that occur during the learning experience and affect the student’s attention and actions. In this stage the student implements the learning strategies that were identified in the forethought stage, and the student also engages in the observation and recording of his or her performance. Students employ self-control methods such as imagery, self-instruction, task strategies, and attention focusing in this stage (Zimmerman, 2002). Willpower is another important component of this stage.

**Self-reflection.** Self-reflection follows the performance or volitional control stage. The student engages in responses to their efforts. At this time the student engages in self-evaluation and makes attributions for their performances. Students who attribute a poor score to limitations in fixed abilities will be less motivated to engage in subsequent efforts, and students attributing poor scores to controllable processes will sustain motivation and employ a different strategy the next time that may lead to success (Zimmerman, 2002). Following this stage, the student returns to either the forethought stage to set additional or modified goals, or to the performance or volitional control stage to employ the learning processes.

Students who are more self-regulated exhibit more control and direction in the three stages of this cyclical process (Lapan et al., 2002) than their peers who are not as self-regulated. In a study conducted by Caprara et al. (2008), 412 students between the ages of 12 and 22 were examined to determine the developmental course of perceived efficacy for self-regulated
learning and the ramification for academic achievement. The analysis revealed that the students experienced a steady decline in their perceived efficacy for self-regulated learning and this decline was greater for male students than female students. Likewise, students who experienced less decline in perceptions of efficacy for self-regulated learning experienced higher high school grades. There is a high correlation between academic achievement and performance on standardized test scores and students’ use of self-regulatory processes (Zimmerman & Martinez-Pons, 1986). Additionally, there is “evidence that students’ use of self-regulatory processes is distinctive from but correlated with general measure of ability, such as verbal ability” (Zimmerman, 2002, p. 69). These self-regulation behaviors can be taught to students (Schunk & Zimmerman, 1994) and can be cemented through experiences in which students are given choices regarding specific academic tasks they would like to pursue or which methods they would like to employ when carrying out complex tasks and assignments. Additionally, these skills can be improved when students are asked to self-evaluate their own performance or competence regarding specific tasks (Zimmerman, 2002).

Engaging in immersive learning experiences should provide students with an increase in their self-regulated behavior. As per the design of the immersive learning experience, students purposefully enlist the forethought, performance, and self-reflection phases of self-regulation. Students, with their classmates, will engage in more self-regulated behavior as they are engaging in these processes with the social support from one another, and the instructor as well.

**Self-Identity**

Self-identity is a comprehensive self-understanding, and self-identity is cemented when adolescents attempt and are able to successfully answer the question of “Who am I.” Luyckx et al. (2013) suggested, “establishing a strong sense of identity provides individuals with a sense of
continuity and sameness, and plays favorably into psychosocial functioning” (p. 701). Erikson (1968) explained that these students are in a stage of identity versus identity confusion where they experience psychological moratorium, or a period of exploration where they are trying to engage in activities with the intent to figure out these questions. Specifically, Erikson described this as a developmental stage he labeled identity versus identity confusion. During this stage, adolescents engage in a psychological moratorium, which can be described as the gap between childhood security and adult autonomy. During the psychological moratorium, the adolescent experiments with different roles and behaviors in their pursuit to establish a new sense of self, or a cohesive self-identity. This exploration occurs in many different aspects of the students’ lives, including but not limited to vocational or career identity, political identity, religious identity, relationship identity, achievement identity, and intellectual identity. These adolescents are attempting to establish their own identities as they see themselves as separate entities from their parents and families. The role and behavior exploration the adolescent engages in during this time aids in the discovery of this self-understanding, and thus their self-identity. A successful outcome occurs when the individual makes a conscious search for identity, and unsuccessful outcomes occur when the adolescent is unable to make deliberate decisions and role confusion ensues (Erikson, 1968).

Marcia (1966) expanded on the research conducted by Erikson to explain an ego-identity status. The ego-identity status includes four distinct ways that the student copes with their identity status. The student is placed into one of these four groups based on their crisis and commitment in two areas, occupation and ideology. These four groups include identity achievement, identity moratorium, identity foreclosure, and identity diffusion. Students who have experienced a crisis period and are committed to an occupation and ideology characterize
identity achievement and ideology (Marcia & Friedman, 1970). These students perform most efficiently “in a stressful concept attainment task, score highest on a measure of overall ego identity, and are resistant to self-esteem manipulation” (Marcia & Friedman, 1970, p. 250). Identity moratorium occurs when students are still in “crisis” and have ambiguous commitments. These students have needs of both rebellion and guidance, often in conflict with one another.

Identity foreclosure includes those students who have not yet experienced crisis, but have a firm commitment to occupation and ideology. Additional characteristics of identity foreclosure include poor performance on stressful concept attainment tasks, high goals that are often unattainable, endorsement of authoritarian values, and vulnerable to self-esteem manipulation (Crowne & Marlowe, 1964). Identity diffusion occurs when students have not engaged in a crisis and have not yet established a commitment to either occupation or ideology. These students score lowest on measures of overall ego identity (Marcia & Friedman, 1970).

Luyckx et al., (2013) expanded on Marcia’s work and explained that students must consistently describe and evaluate their identity commitments as part of their effective identity development. Students must continually gather information (explore) and discuss with others their current commitments, as well as understand “the degree of security and certainty one experiences with regard to current commitments” (Luyckx, 2009, p.i). For example, a student who makes a commitment to be a social worker can explore this commitment by investigating the responsibilities that are involved with social work, determining what educational background must be necessary to be a social worker, talking to social workers who are currently in the field, etc. As the student continues through their school experiences, he or she will continue to evaluate the commitment made to this particular career path. The student may become more
committed to this particular career path through their reflection, or change the career path as he/she reflects on these experiences.

In addition to Luyckx and colleagues, McLean and Pratt (2006) and McLean and Thorne (2003) have contributed to the research on identity development. These researchers have suggested that relationship, autonomy, and mortality events are equally important in the formation of a meaningful identity in the later adolescence years. McLean and Thorne (2003) examined the late adolescents’ (mean age = 19 years) self-defining memories regarding relationships with the adolescent and parents and peers and how this impacts the student’s sense of identity. They found that parent memories emphasized separation (autonomy) more than peer memories, which emphasized closeness (relatedness). Late adolescents may find an increasing balance between autonomy and relatedness, and “these meaningful connections create a sense of unity and purpose in life, and these are the essence of a psychological sense of identity” (p. 644).

Peterson, Marcia and Carpendale (2004) suggested that adolescence is the first time when individuals are physically, cognitively, and socially competent enough to allow for the synthesis of these roles and behaviors in an effort to forge a path toward adult maturity. At this point in the adolescents’ life, they are able to reconcile the multiple selves and identities (such as the religious self, political self, etc.) to answer the central question of “Who am I?” Schwartz et al. (2013) explained that these identities are characterized by the seeking of balance between the needs for autonomy and the need for connectedness.

Students with a well-developed sense of identity understand that their strengths, weaknesses, and their individual differences that make them unique (McLean & Thorne, 2003). Participation in immersive learning experiences should allow for the students to explore different roles and reflect both on their experiences and the role(s) that they may play in these
experiences. As students experience more autonomy and relatedness as part of these experiences, their reflections should allow the students to continually evaluate their commitments and their level of certainty surrounding those commitments. Thus, the students’ self-identity would be more fully realized as a result of this experience.

**Engagement and Learning Outcomes**

Engagement and learning outcomes, including increases in rigor, relevance, and relationships, as well as critical thinking skills should result from experiential learning methodologies. Theoretically, participation in immersive learning opportunities should lead to an increase and deeper meaning in their education. The literature regarding these engagement and learning outcomes is reviewed here.

**Rigor, relevance, and relationships.** Currently, the three principles of rigor, relevance, and relationships are considered cornerstones for engaging learning (Beattie et al., 2015).

“Educational needs of secondary school students are best met by providing them with learning experiences that are both intellectually challenging and connected to the world beyond the classroom” (Williams & Wilson, 2012, p. 471). Rigor in the educational setting can be described as “instruction, schoolwork, learning experiences, and educational expectations that are academically, intellectually, and personally challenging” (Hidden Curriculum, 2014). Although ‘rigor’ is often used synonymously with ‘difficult’, rigor should be considered instruction that is sufficiently challenging to meet the need of the student or team of students, and not just difficult in nature. Rigorous learning experiences encourage and motivate the student to learn more in terms of both breadth and depth, while encompassing academic relevance and critical thinking skills. Students are held to a higher level of academic expectation through these experiences.

Daggett (2008) asserted that relevance in tasks makes rigor possible. “In education, the term
relevance typically refers to learning experiences that are either directly applicable to the personal aspirations, interests, or cultural experiences of students (personal relevance) or that are connected in some way to real-world issues, problems, and contexts (life relevance)” (Hidden Curriculum, 2014). Likewise, when personal relevance in incorporated into the educational experience, it can increase a student’s motivation to learn, to engage in what is being taught within the classroom walls, and even increase the students’ retention and recall.

Immersive learning opportunities employ rigor, relevance, and relationships. Students are pushed to design projects or experiences that challenging as they meet the needs of the community partner they are aligned with, and the need of the community provides an important and relevant experiences. Additionally, as students work in teams to meet the goals and need of the community partner, relationships are formed that meet the needs of the students. These relationships include those relationships between the student, instructor, classmates, and community members.

**Critical thinking.** When students are engaged in an experiential or service-learning model, the students are required to take the lead in applying the knowledge they have learned, providing the reasoning to explain their actions, and demonstrating a deeper understanding of the concepts that have been explored (Azer et al., 2013). When students are engaged in critical thinking exercises and are given the appropriate scaffolding support within the experiential or service-learning opportunity, they will display strong critical thinking skills. Heinrich et al. (2015) explored “several learning experiences that used mindful instructional design of experiential learning to promote critical thinking outcomes” (p. 373). In order to generalize to a larger educational audience, the researchers reviewed four separate experiential learning settings with diverse topics. The study identified four components of experiential learning that supported
critical thinking, including planning, instruction method, content, and explicit critical thinking outcomes.

In another study conducted by Sedlack et al., 2003, the growth of critical thinking in 94 nurses engaged in a service-learning experience was investigated. The results indicated that beginning students were able to develop their critical thinking skills through reflecting on decisions they had made during the service learning opportunity. Additionally, through these reflections the students “provided in-depth examples of critical-thinking development and connection of the experience to learning” (p. 102).

Related Factors Affecting Student Outcomes

As noted above, self-identity, motivation, self-regulation, and learning have the potential to be positively altered through participation in an immersive learning experience. However, it is important to note whether student characteristics and program qualities can affect the degree to which the student engages in the immersive learning opportunity and to what extent the student is affected by this experience.

**Student characteristics.** Although students have been participating in immersive learning experiences at BSU since 2007, relatively little is known regarding the profile of an immersive learning student. Demographic data (such as gender, race, ethnicity) and academic data (performance in high school, high school academic achievement as measured by standardized test scores, what academic year a student chooses to participate) may encourage or discourage participation in immersive learning courses. Other information, such as student expectations of the immersive learning experience, satisfaction with the experience, and reflection of the experience may contribute to the degree in which the student is affected by the experience as well.
**Program qualities.** As mentioned above, immersive learning requires the experience to carry academic credit and focus on student learning outcomes, engage participants in an active learning process, produce a tangible outcome or product, involve at least one team of students, and including community partners to create an impact on the larger community as well as on the student participants. Likewise, service learning also includes participation in meaningful service, experiences with sufficient duration and intensity, and critical reflection. These program characteristics are of importance, and classroom instructors play a significant role in the program as well. According to Campus Compact (2009), 6% of the member institutions’ faculty engage in service-learning and Suldo et al., (2009), suggested that students perceive their teachers to be supportive in their efforts when they “attempt to connect with their students on an emotional level, use diverse and best-practice teaching strategies, acknowledge and boost students’ academic success, demonstrate fairness during interactions with students, and foster a classroom environment in which questions are encouraged” (p.67).

Supportive classroom instructors can impact their students’ well-being (Suldo et al., 2009), and meet their students’ psychological needs (Cheon, Reeve, & Moon, 2012).

Although these programs are designed to theoretically affect the student in positive ways, immersive learning is a unique program that is not currently supported by empirical research. Additionally, fidelity of these programs is of concern. Although programs are designed to meet specific characteristics, efforts to ensure the program is being delivered in the manner that it was created is of importance.

**Conclusion**
Immersive learning experiences have been built upon the backbone of experiential and service-learning methodology. Immersive learning methodology, theoretically, should drive changes in self-identity, motivation, self-regulation, and learning as it occurs within these experiential and service-learning models. Currently, empirical data has not been gathered on this specific program to make those claims. All of the potential changes are important to review with regards to the immersive learning experience; however, this study will focus upon how the immersive learning experiences impinge upon the basic psychological needs of autonomy, competence, and relatedness. These needs are reflective of changes in self-identity, motivation, self-regulation, and learning to varying degrees. By including immersive learning experiences of varying levels (both fully engaged semester projects and experiences as part of course curriculum), the duration and intensity of the experience can be evaluated in relation to changes in these psychological needs as well.
CHAPTER THREE

METHOD

Purpose

The purpose of this study was multifaceted. The study initially built a current profile of the immersive learning student. Then, the study investigated whether the student experienced changes in the basic psychological needs of self-determination while engaged in an immersive learning experience. Lastly, the study determined if changes in self-determination were related to the level of immersion a student engaged in with their immersive learning experience.

Research questions for this study included the following:

1. Are there demographic differences (high school GPA, gender, race, college, and prior immersive learning experience) between students who participated in immersive learning opportunities and students who did not participate?

2. Are there changes in self-determination factors (autonomy, relatedness, and competence) among students who participate in immersive learning?

3. Are there differences in changes in self-determination among students who participate in fully immersive classes, compared to students who participated in partially immersive experiences, and students in non-immersive traditional classes, over the course of one semester?

Research Design

The first research question utilized archival data to investigate demographic differences between students who participated in immersive learning opportunities and those who did not. Participants included students enrolled at BSU from Fall 2007 until Spring 2015. To answer this question, de-identified information was obtained from the Office of
Institutional Effectiveness. This data set contained information from students who were enrolled at BSU from the Fall 2007 semester until the Spring 2015 semester, and included 425,518 records. In particular, students’ SAT (verbal and math) scores, high school GPA, cumulative university GPA, gender, race, college affiliation, academic level (undergraduate versus graduate) and academic status (baccalaureate freshman, baccalaureate sophomore, etc.) were utilized in the study. By obtaining this information regarding past participants of immersive learning, a profile of the immersive learning student was compiled. Details of the population used to answer the first research question are included in the results.

Research questions two and three. Research questions two and three were based upon a quasi-experimental, repeated measures design that included two measurement points for three groups. All groups were given a pre-test survey at the beginning of the semester and a follow-up survey at the end of the semester.

Participants. The population included undergraduate students at Ball State University. The first group consisted of 25 students who were enrolled in either one of two, full-immersion spring seminars (full immersion group). As part of these two seminars, the students were enrolled in several interdisciplinary classes as part of the experience and earned fifteen credit hours for the semester. They were not enrolled in other classes within the university during this time; the immersive learning program was their course of study for the semester.

The second group (single immersion group) consisted of 72 students who were participating in immersive learning experiences as part of their classroom coursework, as deemed by BSU colleges and departments. For example, a student may choose to take a class within a college that has an immersive learning requirement attached to the curriculum, or they may choose to take the same class without the immersive learning experience. These students
earned the credit hours that were attached to the particular class, and did not receive any additional credit for their participation in the immersive learning experience. The Office of Immersive Learning identified several classes that were engaged in immersive learning experiences, and faculty members were contacted to solicit their participation in this study. Seven instructors agreed to allow their students to be contacted to engage in this research opportunity, and 72 students completed both the pre-and post surveys.

Students in the control group (non-immersive group) were 70 undergraduate students who did not participate in any structured immersive learning experiences through Ball State University during the term. Class courses will often provide an “immersive learning” course and a course that does not include the immersive learning component, and a match of these classes was sought. However, when courses were not matched, courses of similar level (for example, 300-level courses) were utilized. Faculty members from mirroring classrooms were contacted, and five instructors agreed to participate in the study; 70 students completed both the pre-and post surveys.

However, once the data was entered into the SPSS statistical software, there were omissions in some cells in the surveys noted. If participants failed to complete all items in the measures utilized, during either the pre and post data collection opportunities, those participants were removed from the study. Therefore, final participants included 20 students in the full immersion group, 56 students in the partial immersion group, and 49 students in the control group.

Measures. Personal and demographic information was collected as part of the pre-semester survey (see Appendix A). Ethnicity, gender, and age were reported, as well as the current college the student was housed in, academic level (undergraduate or graduate), academic
status (freshman, sophomore, junior, senior), how many structured immersive learning courses the student had taken, the student’s current GPA, and how many extra-curricular activities the student participates in on campus.

The Basic Needs Satisfaction in General (BNSG) scale (Ilardi, Leone, Kasser, & Ryan, 1993) was used to measure autonomy, competency, and relatedness. The BNSG is a 21-item questionnaire that utilizes a Likert-type scale format (1 = not true at all, 4 = somewhat true, 7 = very true). The autonomy dimension consists of seven items (i.e. ‘I feel like I am free to decide for myself how to live my life,’ and ‘I generally feel free to express my ideas and opinions’), the competency dimension consists of six items (i.e. ‘People I know tell me I am good at what I do,’ and ‘I have been able to learn interesting new skills recently’), and the relatedness dimension consists of eight items (i.e. ‘I really like the people I interact with,’ and ‘I get along with people I interact with’). The three subscales are dispersed throughout the questionnaire and there are nine items that are reverse-coded. Higher scores are indicative of a higher level of satisfaction of needs.

*Reliability.* According to Ilardi et al. (1993), the reliability of these constructs were autonomy $\alpha = .69$, competency $\alpha = .71$, and relatedness $\alpha = .86$. For the purposes of this study, reliability was also computed using the current participants. Cronbach’s alpha is the most commonly used estimate of reliability and represents the correlation among individual items. The larger the value is, the more consistent the instrument is considered to be. Although there are no concrete guidelines, values equal to/above .90 are considered excellent (appropriate for high-stakes testing), values between .70-.90 are considered good (appropriate for low-stakes testing), values between .60-.70 are considered acceptable, values between .50-.60 are considered poor, and values under .50 are considered unacceptable.
Of the 169 respondents, 165 had completed item responses for the autonomy scale and were included in the analysis. The others were removed for having missing data. In this particular sample, the original Cronbach’s alpha value was .63. The scale had a total of seven items, with one reverse-coded item that stood out with a low correlation (“In my daily life, I frequently have to do what I am told”). This item was removed from the scale and due to poor performance and the Cronbach’s alpha increased to .68. The confidence interval for alpha was determined using the SPSS software package. According to this analysis, the true reliability of Cronbach’s alpha would fall between .60 and .75 with 95% confidence. Because the SPSS software was used, it is important to note that this interval assumes that the population is normal.

Out of the 169 respondents, 161 had completed all items on the competence scale and were included in the analysis. This scale had six items, and the Cronbach’s alpha was .68. This score would be considered acceptable in the analysis. The confidence interval for alpha also was determined for the competence sub-scale using the SPSS software package. With 95% confidence, the true reliability of alpha would fall between .59 and .75.

Out of the 169 respondents, 163 had completed all items on the relatedness scale, with participants excluded for incomplete items. The scale had eight items, and resulted in a Cronbach’s alpha of .78. This statistic would be considered good for social sciences research. Finally, the confidence interval for Alpha was also determined for the relatedness sub-scale using the SPSS software package. With 95% confidence, the true reliability of alpha would fall between .73 and .83.

The Learning Climate Questionnaire (LCQ) (Black & Deci, 2000; Williams & Deci, 1996; Williams, Saizow, Ross, & Deci, 1997; Williams, Wiener, Markakis, Reeve, & Deci, 1994) was used to assess students’ perceived autonomy support from their instructor to use as a
covariate in the analyses, assuming there may be preexisting differences among the students in the various levels of immersive learning classes (as assumed by research question one). The LCQ was adapted by Williams and Deci (1996) and is utilized to determine the degree to which the social context is autonomy supportive for students. Specifically, the scale measures the degree to which the students perceive that the instructor in the course supports their autonomy. This 15-item measure employs a Likert-type scale (1 = strongly disagree, 4 = neutral, 7 = strongly agree) and had test-retest reliability 0.93/0.94 at T1/T2 when utilized in a study conducted by Black and Deci (2000), and had a single underlying factor with high internal consistency (Williams & Deci, 1996). Out of the 169 respondents in this study, 161 had completed all items on the Learning Climate Questionnaire and were included in the analysis. This scale had 15 items, and the Cronbach’s alpha was .96. This reliability score would be considered excellent in the analysis. The confidence interval for Alpha was also determined for the competence sub-scale using the SPSS software package. With 95% confidence, the true reliability of alpha would fall between .95 and .97.

**Procedures.** For research questions two and three, the quantitative data utilized was collected using paper surveys. For all participants, the principal investigator (PI) attended the classes at a pre-determined time to seek participation in the study. The PI explained the study and reviewed the informed consent with the potential participants. All groups were given paper-based surveys in their respective classrooms within the first two weeks of the semester. All data collected was in compliance with BSU’s Institutional Review Board (IRB) and followed protocols developed with accordance to those procedures (Appendix B). The participants were informed of the voluntary nature of the study. Each participant was asked to place a specific code on the surveys. The codes consisted of the students’ mother’s month of birth (in digits),
students’ father’s month of birth (in digits), and last two digits of the student’s phone number. These codes provided the students with confidentiality and provided an opportunity to pair the pre and post survey instruments. The follow-up surveys were given to all groups within the last three weeks of the semester. These surveys were filled out during the normal class periods. The instrument took approximately 15 minutes to complete during the pre-test, but only about 10 minutes for the post-test. Each survey included the date completed to ensure consistency in the data collection process. All data was then entered into a statistical program, SPSS, for analysis.
CHAPTER FOUR

RESULTS

Research Question One

Research question one investigated demographic differences between students who participated in immersive learning opportunities and those who did not. Specifically, what were the differences between students who engaged in immersive learning experiences and students who did not engage in these experiences? Archival data regarding BSU students from Fall 2007 through Spring 2015 were obtained from the Office of Institutional Effectiveness. Student characteristics included gender, race, high school GPA, and SAT verbal and math scores. Additionally, BSU student characteristics included cumulative university GPA, students’ college, academic level (undergraduate versus graduate) and academic status (baccalaureate freshman, baccalaureate sophomore, etc.).

First, descriptive statistics were computed for percentages of gender, race, college, academic level, and academic status and were utilized to compare immersive learning students and students who were not engaged in immersive learning experiences. This information provided an overall profile of the immersive learning student from Fall 2007 through Spring 2015.

Overall, more female students engaged in immersive learning experience than did male students. Females comprised 57.5% of the immersive learning population, and males comprised 42.2%. A chi-square test of independence was performed to examine the relation between gender and participation in immersive learning courses. The relation between those variables was significant; \( X^2 (3, N = 425,519) = 394.453, p < .001 \); showing that females were more likely to engage in immersive learning opportunities than were males (see Figure 4).
Figure 4. Gender. This figure illustrates the differences in gender of immersive learning groups.

The majority of students who engaged in immersive learning experiences were White students (84.6%), followed by Black students (4.8%) and unknown race (2.9%) (see Figure 5). This is reflective of the general population at BSU.

Figure 5. Race. This figure illustrates the differences in race of immersive learning groups.
The College of Science and Humanities enrolled more students than other colleges at BSU, followed by the College of Communication, Information, and Media and the College of Applied Science and Technology (see Figure 6). Non-immersive students were enrolled with the greatest frequency in the College of Science and Humanities, followed by the College of Applied Science and Technology and Teachers College.

*Figure 6. College.* This figure illustrates the differences in overall colleges of immersive learning groups.

Undergraduate students had a higher population of immersive learning and non-immersive learning students than graduate students, although there were more non-immersive learning graduate students than immersive learning graduate students (see Figure 7).
Baccalaureate seniors engaged in immersive learning experiences more than other students. Baccalaureate juniors and graduate masters students had the next highest frequency. However, for those students who did not participate in immersive learning experiences, graduate masters students had the highest population followed by baccalaureate freshman, baccalaureate juniors, and baccalaureate sophomores (see Figure 8).
Figure 8. Academic status. This figure illustrates the differences in academic status of immersive learning groups.

**Achievement Data.** A multivariate analysis of variance (MANOVA) was performed to determine if there was a statistically significant difference in performance on academic measures, including SAT math scores, SAT verbal scores, high school GPA, and cumulative university GPA. First, all variables were converted to z-scores so an appropriate comparison could be made. There was a statistically significant difference in academic performance based on the participation in immersive learning opportunities, $F(4,210199) = 240.702, p < .001$; Wilk’s $\lambda = .995$, partial $\eta^2 = .005$ (see Table 1). Students who participated in immersive learning had statistically significant higher SAT math scores ($F(1,210202) = 192.570; p < .001$, partial $\eta^2 = .001$), SAT verbal scores grammar ($F(1,210202) = 395.282; p < .001$, partial $\eta^2 = .002$), high school GPA ($F(1,210202) = 253.255; p < .001$, partial $\eta^2 = .001$), and cumulative GPA ($F(1,210202) = 793.905; p < .001$, partial $\eta^2 = .004$).

**Table 1.** Means and standard deviations of academic scores for IL and non-IL students

<table>
<thead>
<tr>
<th>Measure</th>
<th>IL group</th>
<th>Non-IL group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$N$</td>
<td>$M$</td>
</tr>
<tr>
<td>SAT Math</td>
<td>9,801</td>
<td>531.93*</td>
</tr>
<tr>
<td>SAT Verbal</td>
<td>9,801</td>
<td>531.95*</td>
</tr>
<tr>
<td>HS GPA</td>
<td>9,267</td>
<td>3.37*</td>
</tr>
<tr>
<td>CUM GPA</td>
<td>12,851</td>
<td>3.24*</td>
</tr>
</tbody>
</table>

*Note. *Significantly different at $p < .001$. 
**Predicted participation.** A follow up discriminant analysis was conducted to determine how SAT math scores, SAT verbal scores, high school GPA, and cumulative GPA are contributing to the group differences. Based on the standardized weights and values of the structure matrix, and 0.3 or 0.4 as a cut-off value to identify variables that are important to distinguishing group differences, SAT math scores (.45), SAT verbal scores (.64), high school GPA (.51), and cumulative GPA (.91) were associated with the significant MANOVA result. Cumulative GPA contributed more to the group differences followed by SAT verbal scores, high school GPA, and SAT math scores. Therefore, cumulative GPA predicts participation in immersive learning opportunities better than the other variables. However, the effect size for the academic scores on participation in immersive learning opportunities was 0%, indicating that these academic scores do not *explain* participation in immersive learning opportunities.

With a zero effect size and a significant result, it was important to review the MANOVA assumptions that underlie this analysis. The first MANOVA assumption is that there is homogeneity of variance matrices. This assumption was assessed utilizing the Box’s M test. The Box’s M test indicated a statistical significance ($p < .001$), indicating the groups’ covariance matrices are not equal. However, this analysis must be analyzed with caution. Due to the sample size utilized in the analysis, it would be expected that a significant result would be found from the large population. When reviewing the means between the SAT verbal and SAT math scores, the differences are not large. In fact, the mean SAT math scores for the immersive learning group ($M = 531.93$) and non-immersive learning group ($M = 519.28$) only differ by 12.65 points. Considering the point value of one SAT correct answer is 10 points, this is the equivalent of an immersive learning student only answering 1.2 questions better than a non-immersive learning student. Likewise, the mean SAT verbal score ($M = 531.95$) for immersive
learning students was only 16.59 higher than the non-immersive learning student ($M = 515.36$), less than two questions better than the immersive learning student. High school GPA revealed less than a .08 difference in the means, and cumulative GPA scores differed by only .10, both less than the equivalent of a half mark in the grading scale (a half mark on the grading scale is the equivalent of .30). Therefore, reviewing the means may provide more information regarding the homogeneity of variances assumption in this particular study.

The second assumption, multivariate normality was assessed utilizing a QQ plot. The QQ plot appeared to hover around the linear relationship, providing evidence of multivariate normality. The third assumption for a MANOVA is independence of observations. The observations were independent of one another, so this assumption was met. Overall, these results must be interpreted with caution given the assumption violation regarding the homogeneity of variances. However, reviewing the means and standard deviations does provide a pattern that provides insight into the nature of students who engage in immersive learning compared to those who may choose not to engage.

**Research Question Two**

Demographic data were collected from students who participated in fully immersive classes, partial immersion classes, and no immersion classes during the spring 2016 semester. This information included gender, race, age, current GPA, current college, academic status, prior immersive learning experience, and participation in extracurricular activities (see Table 2).
Table 2. Demographic statistics for spring 2016 participants.

<table>
<thead>
<tr>
<th></th>
<th><strong>Full IL group</strong></th>
<th><strong>Partial IL group</strong></th>
<th><strong>No IL group</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n = 20)</td>
<td>(n = 56)</td>
<td>(n = 49)</td>
</tr>
<tr>
<td><strong>Gender n (%)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>7 (35.0)</td>
<td>14 (25.0)</td>
<td>14 (28.6)</td>
</tr>
<tr>
<td>Female</td>
<td>13 (65.0)</td>
<td>42 (75.0)</td>
<td>35 (71.4)</td>
</tr>
<tr>
<td><strong>Race n (%)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Am. Indian</td>
<td></td>
<td>1 (1.8)</td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>1 (5.0)</td>
<td>2 (3.6)</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>18 (90.0)</td>
<td>44 (78.6)</td>
<td>44 (89.8)</td>
</tr>
<tr>
<td>Asian</td>
<td>1 (5.0)</td>
<td></td>
<td>1 (2.0)</td>
</tr>
<tr>
<td>Biracial</td>
<td></td>
<td>3 (5.4)</td>
<td>1 (2.0)</td>
</tr>
<tr>
<td>Hispanic</td>
<td></td>
<td>5 (8.9)</td>
<td>2 (4.1)</td>
</tr>
<tr>
<td><strong>Age n (%)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-19</td>
<td>2 (10.0)</td>
<td>5 (8.9)</td>
<td>13 (26.5)</td>
</tr>
<tr>
<td>20-21</td>
<td>13 (65.0)</td>
<td>34 (60.7)</td>
<td>28 (57.1)</td>
</tr>
<tr>
<td>22-23</td>
<td>3 (15.0)</td>
<td>14 (25.0)</td>
<td>7 (14.3)</td>
</tr>
<tr>
<td>&gt;23</td>
<td>1 (5.0)</td>
<td>3 (5.4)</td>
<td></td>
</tr>
<tr>
<td><strong>Current GPA</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>3.46 (.40)</td>
<td>3.37 (.38)</td>
<td>3.45 (.30)</td>
</tr>
<tr>
<td><strong>Current College n (%)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAST</td>
<td>1 (5.0)</td>
<td>16 (28.6)</td>
<td>4 (8.2)</td>
</tr>
<tr>
<td>CAP</td>
<td></td>
<td>14 (25)</td>
<td>8 (16.3)</td>
</tr>
<tr>
<td>CCIM</td>
<td>7 (35.0)</td>
<td>2 (3.6)</td>
<td>3 (6.1)</td>
</tr>
<tr>
<td>CFA</td>
<td>8 (40.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSH</td>
<td>3 (15.0)</td>
<td>7 (12.5)</td>
<td>11 (22.4)</td>
</tr>
<tr>
<td>MCOB</td>
<td></td>
<td>8 (14.3)</td>
<td>3 (6.1)</td>
</tr>
<tr>
<td>TC</td>
<td></td>
<td>7 (12.5)</td>
<td>20 (40.8)</td>
</tr>
<tr>
<td>UC</td>
<td>1 (5.0)</td>
<td>1 (1.8)</td>
<td></td>
</tr>
<tr>
<td><strong>Academic Status n (%)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freshman</td>
<td>1 (5.0)</td>
<td>1 (1.8)</td>
<td>3 (6.1)</td>
</tr>
<tr>
<td>Sophomore</td>
<td></td>
<td>6 (10.7)</td>
<td>13 (26.5)</td>
</tr>
<tr>
<td>Junior</td>
<td>8 (40.0)</td>
<td>16 (28.6)</td>
<td>19 (38.8)</td>
</tr>
<tr>
<td>Senior</td>
<td>11 (55.0)</td>
<td>33 (58.9)</td>
<td>14 (28.6)</td>
</tr>
<tr>
<td><strong>Prior IL experience n (%)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>15 (75.0)</td>
<td>40 (71.4)</td>
<td>37 (75.5)</td>
</tr>
<tr>
<td>Yes</td>
<td>5 (25.0)</td>
<td>15 (26.8)</td>
<td>12 (24.5)</td>
</tr>
<tr>
<td><strong>Extracurricular n (%)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>8 (40.0)</td>
<td>17 (30.4)</td>
<td>12 (24.5)</td>
</tr>
<tr>
<td>Yes</td>
<td>12 (60.0)</td>
<td>36 (64.3)</td>
<td>37 (75.5)</td>
</tr>
</tbody>
</table>
It is important to note the fully immersive courses consisted of two separate classes, or seminars for the semester. These fully immersive experiences are designed to be interdisciplinary in nature. The first seminar explored Muncie, Indiana and produced a surrealistic film called Everyday Life in Middletown. The demographics of the class included gender (males = 5 (45.5%), females = 6 (54.5%)), race (white = 11 (100%)), age (mean = 21.09, standard deviation = 2.02), current GPA (mean = 3.59, standard deviation = .36), current college (CAST = 1 (9.1%), CCIM = 6 (54.5%), CFA = 4 (18.2%), CSH = 1 (9.1%), UC = 1 (9.1%)), academic status (freshman = 1 (9.1%), juniors = 2 (18.2%), seniors = 5 (45.5%)), prior immersive learning experience (no = 7 (63.6%), yes = 4 (36.4%), and extracurricular activities (no = 4 (36.4%), yes = 7 (63.6%)). The second seminar explored Japanese onomatopoeia and produced an app to teach Japanese. The demographics of the class included gender (males = 2 (22.2%), females = 7 (77.8%)), race (black = 1 (11.1%), white = 7 (77.8%), Asian = 1 (11.1%)), age (mean = 21.13, standard deviation = .35), current GPA (mean = 3.31, standard deviation = .42), current college (CCIM = 1 (11.1%), CFA = 6 (66.7%), CSH = 2 (22.2%)), academic status (juniors = 3 (33.3%), seniors = 6 (66.7%)), prior immersive learning experience (no = 8 (88.9%), yes = 1 (11.1%)), and extracurricular activities (no = 4 (44.4%), yes = 5 (55.6%)).

To determine if there were changes in self-determination factors among students who participated in immersive learning experiences, a separate 2 (time) x 3 (group) MANCOVA was conducted with time (measurement points being pre and post semester) as a repeated measure to investigate differences in changes in autonomy, competence, and relatedness between the three immersive learning categories (full immersion, partial immersion, and control). The between subjects variables were the time of assessment (pre-semester and post-semester) and the immersion level of the groups (full, partial, or control). The dependent variables were mean
scores on perceptions of autonomy, competence, and relatedness. The learning climate mean score was included as a covariate in the analysis. The descriptive statistics of the groups are shown in Table 3.

Table 3. Means and standard deviations of autonomy, competence, and relatedness measures for all participants.

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Full immersion (n = 20)</th>
<th>Partial immersion (n = 56)</th>
<th>Control (n = 49)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
<td>Pre</td>
</tr>
<tr>
<td>Autonomy</td>
<td>4.73 (.83)</td>
<td>4.90 (1.04)</td>
<td>5.21 (.70)</td>
</tr>
<tr>
<td>Competence</td>
<td>5.00 (.79)</td>
<td>5.04 (.88)</td>
<td>5.38 (.72)</td>
</tr>
<tr>
<td>Relatedness</td>
<td>5.03 (.75)</td>
<td>5.18 (.55)</td>
<td>5.61 (.77)</td>
</tr>
<tr>
<td>Learning Climate</td>
<td>4.52 (.80)</td>
<td>4.53 (.93)</td>
<td>5.10 (.66)</td>
</tr>
</tbody>
</table>

**Assumptions.** A multiple analysis of covariance (MANCOVA) makes assumptions regarding the data. These include independent random sampling, level and measurement of variables, absence of multicollinearity, normality, homogeneity of variance, and relationship between covariate and dependent variables. The independent random sampling assumption has been met through the data collection procedures; the participants were independent of one another.
In these analyses, the independent variable was categorical (three levels: full immersion, partial immersion, and control), and the dependent variables (autonomy, competence, and relatedness) were continuous variables. Additionally, the covariate (learning climate) was a continuous variable as well. Therefore, the level and measurement of variables assumption was met.

Correlations between the dependent variables were run to investigate multicollinearity. None of the correlations were above .70, falling below the .90 suggested value (Tabachnick & Fidell, 2012). This indicated the absence of multicollinearity assumption was met. The multivariate normality assumption was assessed with the Mardia’s test. Results of the Mardia’s test were insignificant ($p = .24$), indicating that the assumption of multivariate normality was met. In addition, a Box’s M test indicated that the assumption of homogeneity of variance was met for the repeated measures MANCOVA [$F(42,11762) = 1.18$, $p = 0.20$]. Therefore, all assumptions for the MANCOVA were met, and it was appropriate to continue with the analyses.

**Findings.** The between subjects factor in the MANCOVA was immersion level. There was a significant effect for immersion level of the groups ($Wilk’s \lambda = .86$, $F(6, 238) = 3.15$, $p < .01$, $\eta_p^2 = .07$) when accounting for learning climate, and a follow-up univariate analysis was completed (see Table 3). The results yielded an insignificant result for autonomy, an insignificant result for competence, and a significant result for relatedness. Therefore, after accounting for students’ perception of the learning climate, there were still significant differences in changes in perceived relatedness between the full immersion, partial immersion, and control group.

Multiple comparisons, utilizing a Bonferroni correction were performed to distinguish the group differences in relatedness. Results indicated that there was a significant difference between
the full immersion group and the partial immersion group \((p < .05)\), and the partial immersion group reported higher levels of relatedness than the full immersion group (see Figure 9). There was also a significant difference between the full immersion group and the control group \((p < .05)\), and the control group reported higher levels of relatedness than the full immersion group. No significant differences were found between the partial immersion group and the control group with regards to levels of relatedness (see Figure 9).

Table 4. Summary of univariate analyses of repeated measures

<table>
<thead>
<tr>
<th></th>
<th>Group effect</th>
<th>Time effect</th>
<th>Time x Group effect</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(F) ((2,121))</td>
<td>(p)</td>
<td>(\eta^2)</td>
</tr>
<tr>
<td>Autonomy</td>
<td>1.98</td>
<td>.14</td>
<td>.03</td>
</tr>
<tr>
<td>Competence</td>
<td>1.63</td>
<td>.20</td>
<td>.03</td>
</tr>
<tr>
<td>Relatedness</td>
<td>4.35</td>
<td>\textbf{.02*}</td>
<td>.07</td>
</tr>
</tbody>
</table>

*Note. Significant value is in bold.*
Figure 9. Relatedness. This figure illustrates the differences in growth in perceptions of relatedness for all groups.

The partial eta-squared ($\eta^2_p$) was used to calculate effect size, and the following guidelines were utilized: small: $0.01 < \eta^2_p < 0.06$; medium: $0.06 < \eta^2_p < 0.14$; large: $\eta^2_p > 0.14$. The results of this analysis showed that there was a medium effect size for differences in relatedness ($\eta^2_p = 0.07$).

The within subject factor was time and it did not yield a significant effect ($Wilk's \lambda = 0.97$, $F(3, 119) = 1.10, p = 0.35, \eta^2_p = 0.03$) when accounting for learning climate. This analysis indicated that there was not a significant change in autonomy, competence, or relatedness as the semester progressed.

**Research Question Three**

In this analysis, the interaction between the differences in the perception of the students’ perceived levels of autonomy, competence, and relatedness from the beginning of the semester to the end of the semester and the level of immersive (full, partial, no immersion) of the course
when accounting for learning climate was explored. The purpose of this question was to determine whether the level of immersion (full, partial, no immersion) impacted the degree to which the students experienced changes in self-determination factors. In other words, was there an interaction between the level of immersion and the perception of changes in autonomy, competence, and relatedness? The analysis showed that there was not a significant difference for the interaction between the level of immersion and changes in perceptions of autonomy, competence, and relatedness ($Wilk's \lambda = .98, F (6, 238) = .44, p = .85, \eta_p^2 = .01$).
CHAPTER FIVE
DISCUSSION

The purpose of this study was to investigate the immersive learning at Ball State
University and to determine if participation in these courses led to changes in the students’ self-
determination factors, namely their perceptions of autonomy, competency, and relatedness.

Immersive learning is a distinct learning model offered at BSU to allow students to participate in
constructive opportunities with community partners, under the guidance of faculty members.
This hands-on experience provides students the opportunity to design, implement, and evaluate
projects that are meaningful to their community partners. In addition to the sustainable
community project, participation in immersive learning should lead students to develop
professionalism, integrity, and ethics; have an understanding and develop cultural competency,
increase communication skills; take ownership and provide contributions to the project; add to
the problem and solution identification process; integrate their disciplinary knowledge; engage in
teamwork, leadership, and conflict resolution; follow through and commit to the project;
contribute to the overall quality of the project; extend their knowledge; and develop transferable
skills. In the process of this experience, transformative outcomes, such as changes in motivation
(Darby et al., 2013; Levesque-Bristol & Stanek, 2009), self-regulation (Zimmerman 2002),
identity (McLean & Thorne, 2003; McLean & Pratt, 2006), student learning outcomes, and self-
determination factors (Deci & Ryan, 1985) should occur.

However, what is not known is whether or not these immersive learning experiences will
truly lead to these anticipated changes. Since a formal investigation of these factors has not been
completed prior to this study, these pathways are simply theoretical. Therefore, the study served
two purposes. The first investigation was intended to build a profile of the immersive learning
student, and the second investigation was intended to determine whether students engaged in immersive learning opportunities exhibited outcomes indicative of the theoretical models.

Two different samples were used to answer these questions. First, to determine demographic differences for those students who engage in immersive learning opportunities, students attending BSU from the Fall 2007 semester to the Spring 2015 semester were included. Second, students enrolled in full immersion classes, partial immersion classes, and classes not determined immersive in the Spring 2016 semester were used to explore changes in the self-determination factors. Deci and Ryan’s (1985) self-determination model was used as a theoretical framework for this study; specifically, growth in students’ basic psychological needs (autonomy, competence, and relatedness) were examined. Additionally, a learning climate questionnaire was utilized to account for differences in perceptions prior to the experiences.

Data were collected from the Office of Institutional Effectiveness to create the profile of the immersive learning student. This data included both descriptive information (gender, race, college affiliation, academic level, and academic status) and academic achievement information (SAT math scores, SAT verbal scores, high school GPA, and cumulative GPA). On average, immersive learning students tended to reflect similar proportions of females and Whites as represented in the university. However, College of Communication, Information, and Media had a higher rate of students engaged in immersive learning experiences (21.6%) as compared to the overall percentage (9.2%) of students enrolled in that college at BSU. In addition, these students were more likely to be seniors than other academic levels. Moreover, immersive learning students tended to have higher academic achievement: higher SAT scores, higher high school GPAs, and higher university GPAs; however, their effect sizes were minuscule.
When examining differences between full-immersion students, partial immersion students, and students not engaged in immersive learning experiences during the spring 2016 semester, a statistically significant difference among the groups was found in relatedness. Specifically, students engaged in full immersion classes reported less feelings of relatedness than students enrolled in partial immersion classes or students who were enrolled in classes without an immersion experience. However, no significant differences were found between the changes in these perceptions over the course of the semester.

**Implications**

**Immersive learning profile.** The conclusions that emerged from this research demonstrated that participation in immersive learning opportunities were not dependent upon gender, race, or academic level. However, the College of Communication, Information, and Media provided many opportunities for its students to participate in immersive learning experiences. Teachers College, the College of Fine Arts, and University College provided fewer opportunities for their students to engage in these experiences. Academic achievement did not indicate or predict participation in immersive learning courses either. Students with varied achievement qualifications are welcomed and encouraged to engage in these experiences; these experiences are not reserved for those students who perform well on standardized assessments or receive higher grades. In conclusion, equally represented groups of students choose to participate in immersive learning, but some subject areas do a better job of providing these experiences than others. It should be noted that developing immersive courses that meet all of the criteria is extremely time consuming. Without ample incentive to create these opportunities, many faculty will choose to offer more traditional classes.
Relationship between self-determination factors and immersive learning.

Interestingly, students who participated in full immersion classes reported lower levels of relatedness than those students who participated in partial immersion classes and control classes. There was no statistically significant difference between those students engaged in partial immersion classes and non-immersive classes. There also were no differences among the groups on autonomy or competence. Given the outcome of the profile analysis of students who choose immersive learning opportunities, it is not surprising that there were not overall differences among the groups on either autonomy or competence. One might expect the same to be true of relatedness, however. Why would students who engage in immersive learning show lower levels of relatedness? Given that the basic need was lower, both before and after participation in the immersive class, it might be that students who are seeking more connection with others were more likely to choose to participate in immersive learning. Another possible explanation may be that these students were more focused upon the actual service project than in the classroom experience. Their focus may have been upon the service to the community members and their relationship with community partners rather than with their peers through the development of the project. Additionally, one of the fully immersive seminars enrolled students from five separate colleges and the second fully immersive class enrolled students from three separate colleges. Although the diversity was relatively similar in the partial immersion group and control groups, when working in close proximity with a small group of students during an intense project, perhaps feelings of relatedness were not present due to the diversity of the group. In this close proximity, students may have placed an emphasis on feelings of relatedness, whereas this importance may not have been as necessary during the partial and control group, where
relatedness may be perceived as less important due to the short nature of the time students spend with one another.

Unexpectedly, over the course of the semester there was no growth in autonomy, competence, or relatedness in any of the immersive groups. This finding does not reflect the literature that would suggest that experiences where students were engaged in activities that provided foundational autonomy opportunities would result in students’ feeling more interconnected with one another (Gallini & Moely, 2003; Levesque-Bristol & Stanek, 2009; Rania et al., 2014). However, inspection of the means over time and their effects (Tables 2 and 3) revealed very small increases in both relatedness and autonomy in the immersive groups (both full and partial), but no growth in the control group. Although these changes were not significant, perhaps a larger sample size could have revealed some small changes over the short semester. Alternatively, more time engaged in these experiences may be needed to experience changes in these self-determination factors (Seider et al., 2012; Vansteenkiste et al., 2006). A semester of only 15 weeks may not be enough to fully engage students in transformative outcomes. Furthermore, because mean levels of learning climate were lower than individual autonomy for all groups (Table 2), it may be that students did not perceive autonomy support within their classrooms.

Another hypothesis for the findings in this study may be that there is an important difference between the groups that has not yet been identified. Although efforts were made to ensure that a diverse set of characteristics was collected, it may be that there is an unidentified characteristic that has not yet been revealed that may better explain these differences. Further literature and study on immersive learning may expose a particular characteristic that may better clarify these results.
Limitations

Although every effort to ensure that the appropriate data had been collected regarding the legitimacy of the classes engaged in immersive learning from the Office of Institutional Effectiveness, there may have been some classes that provided immersive learning opportunities to their students that had not been identified as an immersive learning course in the data set. Collecting data from the individual colleges and departments, in several different formats, has put the legitimacy of these programs at risk for not being identified as such. For example, many sections of a particular course may have been offered to students, but only one of the sections offered that immersive learning opportunity as part of the curriculum. Colleges and departments have been contacted to determine which specific section should be identified, but with changes in faculty members, and the length of time involved, some of the information could not be verified and thus the course could not be included in this data set. Therefore, caution regarding the descriptive profile of the immersive learning student must be observed.

Another trade-off in this study is in the precision or conclusiveness of the findings. Although efforts to build a profile of an immersive learner should be ongoing after this study is completed, this initial study is limited in its ability to build a comprehensive profile based on the basic demographic characteristics available from the archival data set. By seeking to analyze data from several years ago that were available, there may be questions left unanswered due to the lack of available data that could answer those questions. For example, although gender may be of value in determining the profile of an immersive learner, the better question may be to ask the individual participant what their perceived value of the course would be. Unfortunately, these hindsight questions cannot be answered with the current data set. As is the case with archival data, additional questions may arise during the analysis that cannot be answered due to
the original data set not including that information (Hendrick, Bickman, & Rog, 1993). However, by establishing an existing profile based on the data currently secured, the questions may be answered in subsequent studies.

The sample of participants in this study was relatively small. The fully immersive classes are limited at this time to two separate programs funded through the Virginia B. Ball grants. Utilizing fully immersive classes over additional semesters would provide more information regarding these fully immersive experiences. Additionally, the samples of participants in partial immersion classes and non-immersive cases participants were low as well. Due to the above-mentioned difficulties in identifying classes prior to the beginning of the semester, soliciting classrooms and participants for the study was difficult. Utilizing additional participants would be beneficial to increasing the validity of this study.

The measures utilized in this study regarding perceptions of autonomy, competence, and relatedness were broad, and not specific to the particular courses. Participants were instructed to complete the surveys with regards to the particular class, however, items such as “I feel like I am free to decide for myself how to live my life”; “I really like the people I interact with”; and “Often, I do not feel very competent” may not lend themselves to a true picture of perceptions with regards to the individual classes. Indeed, additional or replacement measures could be utilized so they more fully address the individual’s perceptions with regards to the classroom experience, rather than life in general.

Although immersive learning experiences are defined by and incorporate five characteristics, these experiences may vary in the level of support or curriculum design per class. Therefore, it is not prudent to make generalizations based upon seven classroom experiences. For example, although an immersion class in the College of Architecture and Planning and an
immersion class in the College of Communication, Information, and Media may share these five characteristics, they may offer a vastly different experience for their students. Therefore, caution must be observed when making generalizations about immersive learning experiences in general. Additionally, it would be beneficial to observe classrooms to determine the manner in which instructors are creating immersive environments. These observations may provide additional information as to the diversity of the experiences offered in immersive learning courses, which may explain some of the differences observed during this study.

**Future Directions**

This study showed no differences between groups on perceptions of autonomy or competence, and students enrolled in full inclusion classes possessed lower perceptions of relatedness than their peers in partially immersive and non-immersive classes. Theoretically, immersive learning by design should increase perceptions of these three basic psychological needs. The results in this study do not support immersive learning as a methodology to increase these perceptions, and lead to further questions regarding the purpose of the program. As mentioned, the participants in this study were limited, and generalizations regarding immersive learning should not be made. Rather, a replication study would be wise at this time to determine whether similar results are revealed. If similar results are exposed, the Office of Immersive Learning may re-evaluate their programming efforts to determine whether there is a true benefit to continuing with immersive learning programming as it is currently designed.

The findings of this study may also lead to discussions regarding immersive learning and ideal outcomes to be expected from the experience. Although the Office of Immersive Learning was interested in and requested information regarding transformative outcomes, perhaps a different, but relevant discussion should revolve around the content being offered to students and
expected learning outcomes in lieu of, or in addition to, transformative outcomes. Immersive learning experiences offer eleven learning outcomes these experiences are expected to achieve. Rather than reviewing autonomy, competence, and relatedness, another direction may focus upon outcomes that can more readily be assessed in a semester. One learning outcome includes “ownership and contribution: students will show significant ownership or commitment to the project.” Specific studies could be conducted to determine if these outcomes are being realized through participation in immersive learning opportunities. Another direction may include mastery of content in immersive courses versus non-immersive courses. It is imperative to determine whether the learning outcomes of the courses that are being offered to students in the fully immersive opportunities mirror the same outcomes of those courses in that are not immersive. For example, if a student in a fully immersive experience is receiving three hours of credit for a particular English course, the learning outcomes of the English course should be equivalent to the course that is being offered to students in non-immersive classrooms. If these learning outcomes are not comparable, students enrolled in immersive experiences may be lacking necessary curriculum required for fulfillment of these courses. Yet another avenue worthy of study may fall upon the individual courses that comprise a fully immersive course and how specific content is being delivered between these different classroom environments. It would be prudent for the Office of Immersive Learning to engage in these discussions to further investigate the benefits of immersive learning experiences at BSU, and the ability to truly measure their worth. The answers to these questions are necessary so data-driven decisions can be made regarding the program in its entirety.

Should the Office of Immersive Learning decide to continue with immersive learning programs, there are specific recommendations to be made based upon the results from this study.
First, demographic, categorical data in this study revealed that the highest prevalence of immersive learning students include those students who are female. Female students were enrolled at BSU in higher numbers than males overall, however, there may have been semesters where male students were enrolled in higher numbers than female students. White students, both in immersive learning courses and non-immersive courses, were enrolled in higher numbers at BSU. It may be beneficial to review individual semesters to determine if particular sessions appealed to a more diverse population. The Division of Entrepreneurial Learning may benefit from holding discussions with faculty and staff to increase participation of Black students, Hispanic students, foreign students, and so forth. By providing a more diverse population within immersive learning opportunities, students may benefit from learning and working with students in a more diverse community of learners, a goal of immersive learning at BSU.

Second, the College of Communication, Information, and Media, the College of Science and Humanities, and the College of Applied Science and Technology frequently had the most participants in immersive learning courses. However, the Teachers College, University College, and the College of Fine Arts consistently had lower levels of participation. Due to accreditation demands of these colleges, curriculum decisions may be limited. Yet, the Division of Entrepreneurial Learning may want to contact staff and faculty members in these colleges to discuss possible immersive courses and/or experiences that may beneficial to their students. By engaging in dialogue with these members of the colleges with fewer current participants in immersive learning courses, a more diverse menu of opportunities may be created to meet the needs of all BSU students.

Third, undergraduate students, particularly baccalaureate seniors and baccalaureate juniors, had higher engagement rates in immersive learning experiences. Graduate masters
students were also included in immersive learning experiences with greater frequency.

Individual colleges, with assistance from the Division of Entrepreneurial Learning, may want to design immersive learning experiences that incorporate more of their baccalaureate freshmen and baccalaureate sophomores. By providing an opportunity for novice students to interact and engage with more advanced students, the immersive learning experiences may provide additional opportunities for students to learn from one another.

Finally, the information compiled for this study can be utilized to determine where marketing efforts on behalf of immersive learning may be most effective. Particularly, for those categorical demographics where the sample is low, marketing efforts can be directed to increase participation in immersive learning. Additionally, designing immersive learning opportunities for specific demographics (such as alternative colleges of study) may be beneficial. It would be beneficial for the Office of Immersive Learning to review the programs offered in the specific semester to determine if more diverse experiences need to be designed.

**Conclusions**

This study sought to provide information to the Office of Immersive Learning regarding the profile of immersive learning students, as well as to provide information regarding the relationship between immersive learning and self-determination factors. It would be prudent for the OIL to continue evaluation efforts on immersive learning programs and programming to ensure the goals of the program are being fulfilled. Through continued evaluation efforts, the Office of Immersive Learning can expand on learning outcomes that are successful within the program and modify practices that are not meeting the identified outcome for the student.
References


The unique and cumulative roles of various teacher practices. *Motivation and Emotion*,
37(1), 14-32.


Ramsing, R., & Sibthorp, J. (2008). The role of autonomy support in summer camp programs:


doi:10.1006/ceps.1999.1020

doi: 10.1037//0003-066X.55.1.68


Appendix A

This survey will be given to students both at the beginning and the end of the semester. In order to receive a letter of completion, the student must complete the survey at both opportunities.

Demographic Data

1. Student ID: 6-digit code  (Month of mother’s birthday- last four digits of your phone number)
2. Ethnicity
3. Gender
4. Age
5. Current GPA
6. College
7. Major
8. Academic Status (undergraduate level- freshman, sophomore, junior, senior)
9. Academic Level (undergraduate or graduate)
10. Prior to this semester, have you ever participated in an immersive learning experience at Ball State University? If so, how many?
11. Do you participate in extra-curricular activities on campus? If so, how many?

Basic Psychological Needs Scale

Please read each of the following items carefully, thinking about how it relates to this class, and then indicate how true it is for you. Use the following scale (1 through 7) to respond:

1= Not at all true   4= Somewhat true   7= Very true

1. I feel like I am free to decide for myself how to live my life. A
2. I really like the people I interact with. R
3. Often, I do not feel very competent. C
4. I feel pressured in my life. A
5. People I know tell me I am good at what I do. C
6. I get along with people I come into contact with. R
7. I pretty much keep to myself and don’t have a lot of social contacts. R
8. I generally feel free to express my ideas and opinions. A
9. I consider the people I regularly interact with to be my friends. R
10. I have been able to learn interesting new skills recently. C
11. In my daily life, I frequently have to do what I am told. A
12. People in my life care about me. R
13. Most days I feel a sense of accomplishment from what I do. C
14. People I interact with on a daily basis tend to take my feelings into consideration. A
15. In my life I do not get much of a chance to show how capable I am. C
16. There are not many people that I am close to. R
17. I feel like I can pretty much be myself in my daily situations. A
18. The people I interact with regularly do not seem to like me much. R
19. I often do not feel very capable. C
20. There is not much opportunity for me to decide for myself how to do things in my daily life. A
21. People are generally pretty friendly towards me. R

Learning Climate Questionnaire

1= strongly agree
2= moderately agree
3= agree
4= disagree
5= moderately disagree
6= strongly disagree

1. I feel that my instructor provides me choices and options.
2. I feel understood by my instructor.
3. I am able to be open with my instructor during class.
4. My instructor conveyed confidence in my ability to do well in the course.
5. I feel that my instructor accepts me.
6. My instructor made sure I really understood the goals of the course and what I need to do.
7. My instructor encouraged me to ask questions.
8. I feel a lot of trust in my instructor.
9. My instructor answers my questions fully and carefully.
10. My instructor listens to how I would like to do things.
11. My instructor handles people’s emotions very well.
12. I feel that my instructor cares about me as a person.
13. I don’t feel very good about the way my instructor talks to me.
14. My instructor tries to understand how I see things before suggesting a new way to do things.
15. I feel able to share my feelings with my instructor.
You are being invited to participate in a research study about your perceptions of autonomy, competency, and relatedness as it relates to your participation in courses at Ball State University. The investigator in this study will be Kristine David, doctoral student in the Educational Psychology Department at Ball State University. Dr. Sharon Paulson, Educational Psychology Department Chair will be the supervising professor for this study. This study is being conducted as part of a dissertation project.

You were selected as a possible participant in this study because of your participation as a student at Ball State University. In order to be eligible for participation, you must currently be enrolled in a class at Ball State University and be between 18-99 years of age. Although you will not benefit directly from participating in this study, your experiences and perspectives are highly appreciated and valued. It is our hope that you will be interested in this opportunity to share your insights and perceptions both at the beginning and the end of the semester.

There are no known risks if you decide to participate in this research study. There are no costs to you for participating in the study. The information you provide will be used to determine if and how participation in a class transforms your perception of autonomy, competency, and relatedness. You will be asked to complete a questionnaire that will take about ten minutes to complete at two separate times, both at the beginning of the semester and at the end of the semester. The information collected may not benefit you directly, but the information learned in this study should provide more general benefits.

If you choose to participate in the study, you will be asked to submit a code that is specific to you, but you will not be personally identifiable to anyone else. This code will allow for the research team to match your responses from the beginning of the semester to the end of the semester so comparisons can be evaluated. All data will be entered into a statistical program, such as SPSS, for analysis and will be stored on a password-protected computer. Individuals from the Institutional Review Board may inspect these records. These data will be destroyed in December 2020. Only the members of this research team will have access to all data gathered during this study, and should the data be published, no individual information will be disclosed.

Your participation in this study is voluntary. You are free to decline to answer any particular question you do not wish to answer for any reason, and you are free to withdraw your permission at any time for any reason without penalty or prejudice from the investigator.
If you do not understand any portion of what you are being asked to do, or the contents of this form, the project team members are available to provide a complete explanation. Your questions are welcome at any time. Please do not hesitate to ask your questions and/or mention your concerns during your meeting with the project staff member. Also please feel free to contact Kristine David, 317-417-6952, kadavid@bsu.edu or Dr. Sharon Paulson, 765-285-8522, spaulson@bsu.edu. In addition, if you have any questions about the rights of research subjects, please contact the IRB (Human Subjects) Director, Office of Research Integrity, Ball State University, Muncie, IN 47306, (765) 285-5070 or irb@bsu.edu.

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