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Do credit-based transfer programs have an impact on intellectual development from secondary education to post-secondary education?

by

James J. Uhlenkamp

A DISSERTATION

Presented to the Faculty of
The Graduate College at the University of Nebraska
In Partial Fulfillment of Requirements
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(Educational Leadership and Higher Education)

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DO CREDIT-BASED TRANSFER PROGRAMS HAVE AN IMPACT ON
INTELLECTUAL DEVELOPMENT FROM SECONDARY EDUCATION TO POST-
SECONDARY EDUCATION?

James J. Uhlenkamp, Ed.D.

University of Nebraska, 2012

Adviser: Donald F. Uerling

This descriptive, retrospective quantitative study identified the influence credit-based transfer programs have on the intellectual development positions of matriculates at a Midwestern, private, residential, church-affiliated master's degree granting university. This presents a better success measure for these programs than the measures used in previous studies: academic momentum, persistence, college grade point average, and degree attainment. Transitioning through these positions develops critical thinking skills and more of the habits of mind that characterize a well-educated person.

An evaluation database developed for the target university's first-year experience program provided demographic information and scores intended to identify the students' dominant intellectual development position. William Perry's scheme of intellectual and ethical development provided the framework and William Moore's *Learning Environment Preferences* (LEP) provided scores.

Participants were assigned to cohorts based on enrollment in a target program: advanced placement, joint enrollment, both advanced placement and joint enrollment, and regular high school program. One-way ANOVAs determined the existence and direction of differences in mean LEP scores between cohorts and the influence of the

curricular area. Pearson correlations determined the significance of the frequency of program access and the relationship of demographic and academic success factors to LEP scores. An independent-samples t-test investigated the relationship of program access and placement into developmental classes.

Enrollment in a combination of advanced placement and joint enrollment programs correlated with more complex positions. Increased exposure and curricular area did not correlate with more complex positions. A significant negative effect was found between program access and enrollment in developmental programs. Of the demographic and academic success factors, only participation in the fine arts and student government in college was correlated with more complex intellectual development positions.

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Chapter 1

Introduction

Statement of the Problem

High schools greatly increased credit-based transfer program enrollments from 2001 to 2011 (Hargrove, Godin, & Dodd, 2009), so that up to 62% of matriculates have earned at least some college credit while in high school (Zunkel, et al. 2011). Originally conceived as opportunities to increase rigor and opportunities for advanced high school students, credit-based transfer programs have been opened to include virtually any interested high school student. From 2001 to 2011, many reports encouraged this expansion in an effort to increase rigor in the high school, to spur student interest in class work, to reduce time and student cost to post-secondary graduation, and to provide the students with anticipatory socialization (Bailey, Hughes, & Karp, 2002; Delicath, 1999; Hughes, Karp, Bunting, & Friedel, 2005; Karp, 2007). Anticipatory socialization occurs when a person is exposed to the practices and expectations of a group to which they may aspire. The goal of anticipatory socialization is to ease the transition into the target group.

While these goals are laudable, few studies have critically examined the effectiveness of these programs. Credit-based transfer programs allow students to enroll in and receive credit for general education or career and technical education college classes while still in high school. Credit-based transfer programs include joint enrollment classes, which are typically offered on the high school campus by community colleges, and advanced placement classes, which are College Board-approved high school classes. Advanced placement students may be granted college credit if they pass a rigorous, standardized subject matter exam.

As college credit-bearing courses, all of these credit-based transfer programs should significantly influence the intellectual development of students over regular high school programming. For the purposes of this study, intellectual development will be defined using William Perry's scheme of intellectual and ethical development (1970) as a framework. The studies on which Perry's scheme is based sought to describe the epistemology of male students at Harvard University, beginning in 1953. For the purposes of the current study, epistemology is defined as the conscious and unconscious conceptions and assumptions of knowledge and learning that govern the thoughts and actions of college students.

This study measured intellectual development using the *Learning Environment Preferences* (LEP) (Moore, 1989, 2000) to determine whether credit-based transfer programs have this desired effect on intellectual development. Because passing a joint enrollment class grants students college credit, these classes should be as effective as advanced placement in advancing a student's intellectual development, if not more so, since teaching critical thinking is a universal goal of college general education programs (Moore, 2000; Pascarella & Terenzini, 1991; Perry, 1970).

This study examined the efficacy of credit-based transfer programs in advancing the intellectual development positions of matriculating college students. The study's population included the full range of first-year students in the Fall of 2011 at the target university, from advanced to developmental students.

Perry's Scheme of Intellectual and Ethical Development. William Perry's scheme of intellectual and ethical development (1970) included nine different positions, divided into four forms, which indicated distinct visions of the nature of knowledge. In

his seminal work, Perry (1970) explained why he preferred the term "scheme" rather than theory and "position" rather than stage to describe his epistemological framework. He stated "position" implied no assumptions regarding the duration of a transition, and it represented a dominant mode of thinking about knowledge, rather than a well-defined approach to knowledge. The imprecision carried by his use of the term scheme more accurately represents his view of the flexible, fluid nature of epistemology.

The term "Perry position" will be used in this study to refer to the positions described in Perry's 1970 study. Progress through the Perry positions is not smooth and continuous (Baxter Magolda, 1988) but rather moves in surges (Perry, 1970) or tectonic shifts. Additionally, Perry clearly stated that transitions in the positions may not always be progressive, positive, or permanent. Perry also pointed out that a person will use different positions within or between forms to respond to a given situation. Given the right circumstances, it is possible for a student to temporarily take a more advanced position than would normally be held, and once these circumstances fade, to return to the normal or more typical position. Indeed, these temporary surges from one position into another may enable or prepare the student for the tectonic shift, after which the more complex position can be held for a more sustained time or even permanently. Perry stated that it is possible to determine a "central tendency among the forms" (p. 3) through which a student typically filters experiences.

The first form, simple dualism, views knowledge as handed down from "on high" by inerrant experts. This first form extends from position one to as late as position five, depending on the person and the context. The second form, complex dualism, describes an understanding that multiple points of view exist and can be valid. This form

characterizes most students at or near high school graduation, extending from position three to as late as position seven. The third form, relativism, understands that different contexts can indicate whether a course of action or a position is “right” or “wrong”. Perry stated that this form can include position five through to the ninth and final position. The final form, commitment in relativism, asks for firm commitments to a way of working, thinking, and living. It ranges from position six to the ninth position. Figure 1 below illustrates the overlap of the four forms and their relation to the positions in Perry’s scheme.

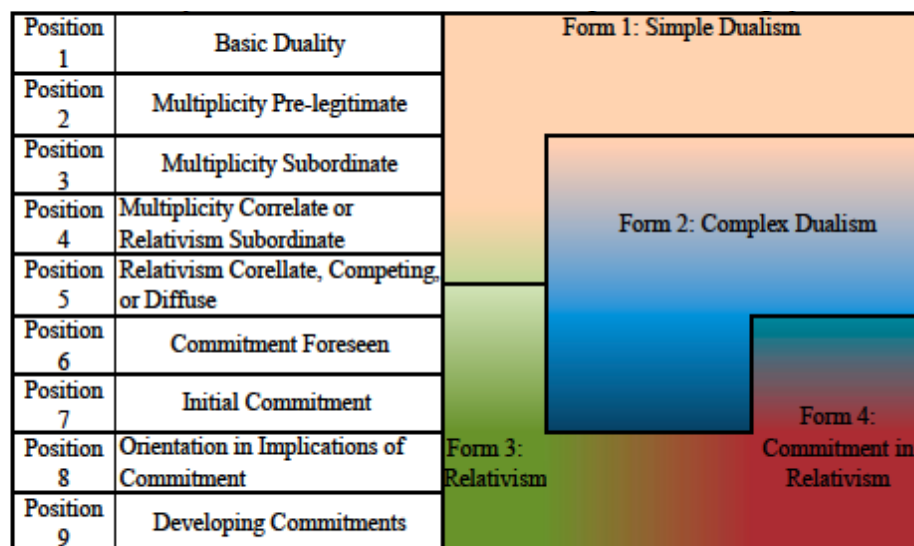


Figure 1. The Perry scheme of intellectual and ethical development in the college years.

The ranges within the forms indicate the ability of a person in a given form to use more or less complex epistemologies in dealing with the complexities of their worlds (Perry, 1970). For example, in the right context, a high school student who might typically be placed in position two may be able to approach a particular situation using

the relatively more complex epistemology of position four. A student in position two typically will look for single correct or “best” answers to questions. In position four, the student is able to entertain the idea that there may be multiple correct answers for a given situation, but be unable to defend effectively a chosen correct answer. The student may be able to maintain the more complex epistemology only temporarily at first or may require significant instructional scaffolding. As greater experience is attained, the student may be able to sustain position four independently. At this point, the student can be said to have moved into form two.

Conversely, a student who typically uses an epistemology typical of position five may, in the proper circumstances, retreat to position three. In position five, students can begin to defend their chosen correct answers using evidence. However, students in position five are capable of retreating as far back as position three, in which they may give only lip service to an opposing answer and fail to entertain or consider the evidence in support of it.

As they practice using more complex epistemologies, students may regress or make negative transitions in response to stressors in the environment. Perry (1970) termed these negative transitions “temporizing, escape, and retreat” (p 57-58). Emotions, family, friends, culture, and surroundings can all significantly impact stress levels. Reactions to stressors can be academic, social, financial, or personal. The cognitive disequilibrium resulting from a challenging academic environment can lead to these negative transitions, even to the point of causing students to discontinue, at least temporarily, their educations. This is most likely in cases where they do not receive academic and social supports sufficient to allow them to restore the desired equilibrium

(Piaget, 1977a). Success in restoring the equilibrium can lead to the tectonic shifts in intellectual development that mark a successful college education. Inadequate academic preparation, social maladjustments, and inadequate coping skills can trigger these feelings of stress and a regressive response.

In temporizing, a student remains in a position for a lengthy period. Perry (1970) indicated that this may last for up to a year. During this time, temporizing appears not to be a delaying tactic as the term may imply, but rather a time of consolidation and rehearsal (King & Kitchener, 1994). This rehearsal and reinforcement of the thinking that is characteristic of the position may help to prepare the student for the shift into the next stage. It is conceivable that students could willfully temporize longer, until another event introduces sufficient cognitive dissonance (Baxter Magolda, 1988) to require them to resolve the dissonance (Festinger, 1957). In escape, students are settling for a position, and they reject organized information or viewpoints which may introduce cognitive dissonance. Retreat is characterized by an outright rejection of alternative viewpoints in preference for accepted opinions and facts.

A possible source of these regressive decisions may lie in the idea that as students move from position to position, they may be leaving preferred conceptions of their identity, or family and friends behind, and this may lead to feelings of grief or guilt (Kloss, 1994). At the least, Perry states, “[s]tudents who have just taken a major step will be unlikely to take another until they have come to terms with the losses attendant on the first” (cited in Kloss, 1994).

Perry (1970) stated that his records indicate that there are a “limited number of paths” (p. 71) from dualism into multiplicity. Most matriculating students are in position

two or three, which means they are beginning to transition from dualism to multiplicity. They may recognize the importance of diversity and multiple viewpoints, but will frequently assume that there is still one correct answer. An alternative view, which is more characteristic of position three, states either that those in authority do not have the correct answers yet, or the true authorities are not available. By college graduation, it is hoped that most students will have reached position four, which holds that knowledge is little more than opinion, and that everyone's opinion may be equally valid. Areas of agreement tend to be viewed as little more than conformity, and areas of disagreement are merely examples of misinterpretation (Baxter Magolda, 2001). The fact that many students leave college in this position has opened colleges to attacks that they seek to undermine morals and culturally accepted norms (Bloom, 1987). Exposure to the workplace and the adult world can advance people through to position five. Graduating students who exhibit a further range of intellectual development have begun to enter position five, or the beginning of the relativist forms. In relativism, the students begin to see that correct answers may use different criteria in different fields.

Learning Environment Preferences. The LEP (Moore, 1989, 2000) is a constructed response inventory designed to identify the intellectual development positions of participants according to William Perry's (1970) scheme of intellectual and ethical development. The LEP is limited to placing a student in positions 2-5 on Perry's scheme. Moore (1989) stated that positions 6-9 can only be determined using qualitative methods. In these advanced positions, the students begin to understand the contextual nature of knowledge and truth and begin to make or solidify commitments to their choices. A constructed response instrument capable of accurately measuring these

positions has not yet been developed. According to Moore (1989) the polar epistemology characteristic of position one is simply not found in students of college age.

The LEP presents 65 recognition items of increasing complexity in five domains (Moore, 1989) that characterize a classroom or other aspects of the learning environment. The five domains are “(a) views of knowledge and course content, (b) role of the instructor, (c) role of the student and peers in the classroom, (d) the classroom atmosphere, and (e) the role of evaluation” (Moore 1989, p. 506). The domains describe the student’s preferred environment for learning, from the how the lesson is designed to the actions and attitudes of each person in the classroom. The inventory presents the recognition items on a 1-4 Likert scale. After the items have been rated, the students are asked to rank their top three responses for each domain. These top three preferences in each of the five domains have been shown to reflect the student’s epistemology regarding classroom behaviors and concerns (Moore 2000). Using these preferences, the LEP provides two scores describing the student’s intellectual development position: the R-Index and the Cognitive Complexity Index (CCI).

The R Index reflects how much the respondent’s range of scores correlates to position 5 (Moore, 2000). The R Index is presented as a percentage. The CCI, with scores ranging from 200-599, is calculated using the respondent’s top three scores in each domain (Moore, 1989, 2000). Scores on the CCI indicate the nuanced epistemological positions reflected in educational progress. A score of 200, for example, indicates that the student is solidly in position 2, which is the higher position in simple dualism. A score of 250 would indicate that the student is in a transitional state. The inventory assumes that more complex positions of intellectual development correlate with preferences for certain

characteristics of the classroom environment. All of the published instruments measuring intellectual development using the Perry scheme make this assumption. The LEP can be completed easily within 30-45 minutes.

Iowa Education Summit. Enrollment in credit-based transfer programs in Iowa nearly tripled from 2004 to 2010 (Credit Enrollment, 2004; Joint Enrollment Report, 2010) and Ohio more than tripled its participation in the same time (Denecker, 2007). Other states also greatly increased their enrollment in credit-based transfer programs (Schneider, 2011; Bailey, Hughes, & Karp, 2002), and calls to increase this access even more have been heard (Smith, 2007). In July 2011, Iowa held an education summit discussing the challenges of preparing high school students for higher education and for the workforce (Iowa Department of Education, 2011). The final minutes of this roundtable involving school superintendents and college presidents highlighted conflicting views of credit-based transfer programs, specifically joint enrollment. The superintendents focused on the influence and benefits that their curricula could obtain from joint enrollment (Bailey, Hughes, & Karp). The college presidents were mostly concerned with the quality and preparation of the students who were entering their colleges, sometimes with considerable transfer credit on their transcripts (Iowa Department of Education). Both groups noted that high school preparation was not always what it could be, but appeared to disagree as to the appropriate response. Superintendents wanted to increase rigor by expanding the reach and impact of joint enrollment, while the college presidents preferred to examine the developmental appropriateness of joint enrollment and the motivations of the joint enrollment students and their families (Iowa Department of Education). Iowa's laws term the joint enrollment

classes in the high school setting as “contracted” classes. These contracted classes are the most commonplace arrangements, both in Iowa and nationally.

High school preparation issues. Gregory Geoffery, president of Iowa State University at the time of the Iowa education summit, stated that many of the joint enrollment students entering Iowa State University were not well prepared in the prerequisites for which the transcript indicated they had earned credit (Iowa Department of Education, 2011). The clear implication was that these students struggled in their middle and upper division college classes, because education includes thinking skills as well as content (Bailey, Hughes, & Karp, 2002; Denecker, 2007). Serious attempts to address these concerns were described as early as 2002 (Bailey, Hughes, & Karp), but no progress has been made due to political inertia, apathy, and a lack of a solid data infrastructure (Hargrove, Godin, & Dodd 2008). Kent Henning, president of Grandview University in Des Moines at the time of the Iowa education summit, pointed out that dual enrollment in Iowa had increased over 115% in the past decade, but that Iowa ACT scores had remained flat. Henning discussed, but did not identify, a Des Moines area school district that allowed second- and third-year high school students with GPAs of 1.1 to enroll in joint enrollment courses from a community college (Iowa Department of Education, 2011). Not stated, but clearly a consequence in their minds, is the fact that once a student has earned college credit from a community college, articulation agreements require that this credit be accepted as evidence of college readiness, allowing perhaps underprepared students into the universities.

Lacuna of research. Despite the time and fiscal and human resources devoted to credit-based transfer programs in high schools and colleges, little empirical evidence

exists to document the efficacy of these programs (Denecker, 2007), and much of this is little more than “cheerleading” (Bailey, Hughes, & Karp, 2002, p. 13). The dissertations and studies that have examined the effects of credit-based transfer programs have looked primarily at degree attainment and persistence, and their findings have been mixed (Denecker, 2007; Hargrove, Godin, & Dodd, 2008; Hinojosa & Salinas, 2011; McComas, 2010; Mead, 2009; Swanson, 2008; Zunkel, et al, 2011). The National Center for Education Statistics (2001, cited in Bailey, Hughes, & Karp) reported that two-thirds of high school graduates had completed some college, but only one-third of these had completed a baccalaureate degree. Academic productivity and time to degree have been influential topics in discussions of educational acceleration programs (Reindl, 2006). Degree attainment is no doubt a critical marker of success for a higher education system. Indeed, as a recent report from Georgetown University’s Center on Education and the Workforce stated, employers are willing to pay a premium for college graduates, even for jobs that do not obviously require college-level skills (Carnevale & Rose, 2011).

Measures of success. Education is the challenge and confirmation of a person’s current or developing epistemology, engineered through carefully constructed and presented cognitive crises or lessons. These crises can be formal or informal; physical or virtual; verbal, auditory, tactile, or kinesthetic. They can be positive and growth-motivating, or they can be negative and stultifying.

To be successful components of an education, these crises require a more profound learning than just facts and formulae. The learning required involves shifts in the students’ epistemology (Ginsberg & Opper, 1988). Piaget (1977a) stated that people strive to maintain equilibrium in their epistemology. If this equilibrium is challenged by

lessons or readings, the student must react to this challenge. Typically, the student will attempt to accommodate the new information in the existing schema, but if that is not possible, then the student must assimilate the new information and construct a new schema. Piaget (1977b) believed that this assimilation occurred through reflection, which re-established and improved equilibrium following this cognitive crisis (Ginsberg & Opper). This process of accommodation, assimilation, and equilibration continually operates as people go through their daily lives.

These crises have been referred to as cognitive dissonance (Festinger, 1957), which describes the tension between a student's epistemology and new information that tends to lead toward shifts in epistemological positions. In Festinger's view, a person seeks agreement among opinions, actions, and statements. When differences among these become irreconcilable, then the person must seek to resolve the tension. Like Piaget (1977b), Festinger described cognitive dissonance as a normal part of life, and not a great source of stress, since in most cases it could be resolved by Piagetian accommodation with existing schema. When this strategy fails, the student must attempt to assimilate the new or conflicting information (Ginsburg & Opper, 1988). While Festinger did not use Piaget's terms to describe the efforts to regain equilibrium, it is clear that he shared the idea that people generally wish to achieve this epistemological balance. He also recognized that the effort to re-establish equilibrium may not meet with success, thereby increasing cognitive dissonance. Eventually, this tension may build to a critical point, resulting in a shift to the next position of intellectual development.

Festinger (1957) and Piaget (1977b) recognized that in some cases, a person would attempt to avoid situations resulting in cognitive dissonance. In certain

circumstances, this avoidance correlates with Perry's (1970) temporizing behaviors. Another concept from Festinger that relates to temporizing is forced compliance. In forced compliance, a person pretends to agree with concepts or statements that are contrary to their actual thoughts. A temporizing person may act this way to delay the development of cognitive dissonance and to attempt to preserve equilibrium (Piaget 1977b). A student in Perry position three may claim or even believe that they understand the existence of differing and equally valid perspectives, yet that student may doubt the equality of the views. This study will refer to these cognitive crises as tectonic shifts, since the primary investigator believes the term more accurately illustrates the gradual building and sudden release of cognitive pressure. The effect for the individual person can be world-shaking and -shaping.

This result depends in part on the amount and character of the support and scaffolding provided. The goal of education is to scaffold students to more complex intellectual development positions (Moore, 2002). This study investigated participation in credit-based transfer programs to find if it positively influenced the transition of matriculating college students from one intellectual development position to another.

Possible stressors. A transition from one position (Perry, 1970) to another can come with unpleasant "affective baggage" (E. Nuhfer, personal communication, June 27, 2011). In first-year students, this affective baggage could present as homesickness, both literal and figurative, as these students begin working through the mourning and grieving (Kloss, 1994) for their former selves. If they succeed in making the transition to the next position, or even become comfortable with the cognitive dissonances (Festinger, 1957) and ambiguity that can characterize the medial stages of the self-authoring process

(Baxter Magolda, 2007), they can and will persist in college. Poorly negotiated, homesickness and mourning could easily lead to a decision not to persist.

Credit-based transfer programs as cocoon. Given the right circumstances, the students can find the support and confidence to believe that they can work through these hard transitional times, and that the tectonic shift or “light bulb” moment that signals a successful transition will come for them. Such a supportive yet challenging situation can be provided by effective credit-based transfer programs. These programs may provide a buffer or cocoon (Schneider, 2011; Tinberg & Nadeau, 2010; Uhlenkamp & Glenn, 2011) to support high school students as they experiment and grow into the new intellectual and psycho-social positions required for success in college and career. In this view, the credit-based transfer program students engage in anticipatory socialization to learn the academic and social expectations of college. This anticipatory socialization may help them progress toward the multiplistic positions (Perry, 1970) expected of college students. If this is successful, credit-based transfer program students may still place in dualistic ratings, but they will place in the upper levels upon matriculation. For these students, the social adaptation becomes of paramount importance. The non-credit-based transfer program students have to deal with the intellectual and the psycho-social demands at once.

Professionals concerned with the transition from high school to college and parents, employers, and legislators concerned about the development of a competent workforce worthy of a modern democracy should all work together to develop policies and practices that will best develop our students. This study will lay a base for understanding how instructors can structure educationally appropriate activities and

lessons to help students transition most effectively through positions of intellectual development.

Research Questions

Research purpose. The purpose of this quantitative study was to compare the positions in intellectual development of four cohorts of 2011 high school graduates matriculating to a private, residential, church-affiliated, Midwestern master's degree-granting university. William Perry's (1970) intellectual development theory provided the theoretical framework for this study.

Central research question. Do credit-based transfer programs influence the transition of matriculating college students from one intellectual development position to another?

Research question. Do four groups of high school graduates (regular program, advanced placement, joint enrollment, and both advanced placement and joint enrollment) differ in intellectual development position upon matriculation to a residential university?

Subquestions.

1. Does the frequency of exposure to credit-based transfer programs, as measured by attempted advanced placement testing or as measured by transferred credit hours, have an association with relative progress through intellectual positions?
2. Does participation in credit-based transfer programs in the humanities and social studies have a greater positive association with students' intellectual development than participation in programs in other subject areas?

3. Does participation in credit-based transfer programs have an association with placement into college developmental classes, based upon institutional placement scores?
4. Do demographic and academic performance factors have an influence on relative progress through intellectual positions?

Variables and Their Measures

The dependent variable was intellectual development position as defined by Perry (1970) and measured by the LEP (Moore, 1989). The independent variables were the participants' assignment to four credit-based transfer program-defined groups: regular high school program, advanced placement, joint enrollment, both advanced placement and joint enrollment. Additional independent variables included a range of demographic and academic success information:

- a. Gender
- b. Age
- c. High school GPA
- d. ACT scores
- e. SAT scores
- f. Milieu of the credit-based transfer program
- g. First semester, first-year college GPA
- h. Athletic participation
- i. Co-curricular participation
- j. Persistence to spring semester

The first semester, first-year GPA considered only the grades earned in the target university. Any transfer GPA from the credit-based transfer programs are accounted for in the high school GPA.

Appendix 2 defines thirteen different milieu of joint enrollment programs found in American schools in one degree or another. The milieu were divided by location: on the college campus, the high school campus, or online. These three categories were further divided by the type of faculty teaching the class: full time college faculty and staff, adjunct faculty, or high school teacher. The online classes were further distinguished by the existence and source of monitoring of the student's progress. Advanced placement classes are, by definition, high school classes on a high school campus taught by a high school teacher, although joint enrollment classes can also fall into this milieu.

Significance of the Study

High school credit-based transfer programs have expanded rapidly, despite a shallow empirical research base to guide program development (WICHE, 2006). This study will advance the base by examining the influence credit-based transfer programs have on intellectual development (Perry, 1970). This examination compared students who enrolled in advanced placement, joint enrollment, and regular high school programs. The knowledge from these comparisons may lead to more effective policies and practices and ultimately improve student learning and optimal student development.

A finding that credit-based transfer programs have little impact on intellectual development could mean that these programs achieve little more than allowing students to skip classes that could have benefitted them by easing these transitions. Reports have

indicated that college has distressingly little impact on the critical thinking of students (Arum & Roska, 2011; Pascarella, et al., 2011). Trying to save money and time in credit-based transfer programs may result in the inadvertent slowing of students' intellectual development, a reduction in academic achievement and skills, and the hindrance of other psycho-social adaptations. The result of this may be an increased cognitive load (Paas, Renkle, & Sweller, 2003) on the incoming first-year students.

If credit-based transfer programs fail to properly induct students into the culture of academia and to help transition students into a new intellectual development position (Perry, 1970), this failure could lead to greater levels of stress. Poorly negotiated stress can lead to regression or what Perry referred to as temporizing, escape, and retreat. Perhaps the most significant area of regression for college students would be intellectual development. Stalled or regressive intellectual development could lead to lower academic achievement or to the development of maladaptive behaviors, such as poor study and learning decisions. This prolonged or increased transitional stress could increase the likelihood of a decision not to persist, with long-term consequences for the student and for the national economy.

Credit-based transfer programs are not fads, and this genie won't be bottled up again. If credit-based transfer programs fail to advance the students' intellectual development as expected for college classes, educators must identify the practices that impede intellectual development. This study will help to begin that identification by using Perry's theory of intellectual development (1970) to examine matriculates at a private, Midwestern master's degree-granting university. The cohorts for this study were based on program participation in high school: regular program, joint enrollment

program, advanced placement program, or participation in both joint enrollment and advanced placement programs.

Assumptions

The study assumed that credit-based transfer programs in the humanities and social studies will result in transitions of a higher degree than credit-based transfer programs in other curricular areas. This assumption rested on the belief that the humanities and social studies encourage students to discuss, consider, and accept differing points of view using incomplete, conflicting, or contradictory information. Other curricular areas are more likely to pose questions that yield limited, definitive answers (King & Kitchener, 1994). The higher degree of comfort with ambiguity in solutions and conclusions that the humanities and social studies demand is characteristic of transitions to more complex intellectual development positions.

The study also assumed that a more complex intellectual development position can be indicated by high school and college GPA, college entrance test scores, the milieu of the credit-based transfer program, and participation in extra- or co-curricular programming.

Definition of Terms

Since some of the terms in this study are closely related, the following definitions help to clarify the intended meanings. The literature regarding joint enrollment used several of these terms to refer to the same programming and policies.

Advanced placement: Specially designed, highly rigorous high school classes taught by high school teachers on the high school campus. The College Board (2005),

which owns the advanced placement exams, must approve the syllabus of a class before it can be called advanced placement.

Anticipatory socialization: The exposure of non-group members to the practices and expectations of an aspirational group, with the goal of easing the transition into the target group.

Cognitive dissonance: A condition of mental tension in which a person's schema are challenged or questioned by contrary or new information.

Concurrent enrollment: College level classes allowing high school students to enroll, but which typically do not yield high school credit, depending on the policies of the institutions. Both institutions count the student in their head counts, although one or the other may not receive state aid for the student.

Contracted classes: A term used in Iowa to denote a college level class allowing high school students to enroll, and which is taught on the high school campus by a high school teacher. Both institutions count the student in their head counts. The high school can receive increased state aid, but the college does not receive any additional aid.

Credit-based transfer programs: Any of a range of class formats intended to generate college credit for high school students. The credit may be generated by the classes themselves or by passing a rigorous exam.

Dual credit: College level classes allowing high school students to enroll, and which yield high school and college credit. The college may or may not include the high school student in its head count.

Dual enrollment: College level classes allowing high school students to enroll, and which yield high school and college credit. Both institutions count the student in their head counts and therefore both can receive state aid.

Epistemology: The conscious and unconscious conceptions or assumptions about knowledge and learning that govern thoughts and actions.

First-year student: A college student entering full-time college study for the first time. For the purposes of this study, these students are entering directly from high school and may or may not transfer college credit. Typically, a first-year student will have between 0 and 23 semester hours. However, for the purposes of this study, all students entering college directly from high school are classified as first-year students, regardless of the amount of credit transferred or of the source of the credit.

Fourth-year student: A student in the final year of study in a four-year college or high school. At the college level, the fourth-year student will have earned more than 88 semester hours of credit and at least 176 grade points.

Intellectual development: William Perry (1970) chose this term to denote the changing of a student's epistemology as various educational and life experiences are encountered.

Intellectual development position: William Perry (1970) chose to use the term "position" rather than "stage" in his scheme of intellectual and ethical development because this term implies no assumptions regarding duration. This term can express "the locus of a central tendency or dominance among these structures" (p. 48) and he liked the semantic connection between his term and the concept of *Weltanschauung* or "point of outlook" (p. 48).

Joint enrollment: A term used to include all forms of college-high school partnerships designed to provide high school students with the opportunity to earn college credit. Joint enrollment may or may not provide high school credit and may or may not provide the sharing college or high school with additional funding.

Learning Environment Preferences: A constructed response inventory designed by William Moore (1989) to place students in an appropriate position in William Perry's scheme of intellectual and ethical development (1970). This inventory was used in the first-year experience program evaluation in the target university. The resulting program evaluation database was used as a source to develop the database for the study.

Post-secondary enrollment option: A term used in legislation in several states to include several varieties of college level classes allowing high school students to enroll. This term does not, in itself, imply anything regarding the award of credit at either institution.

Role rehearsal: The active participation in the practices and expectations of an aspirational group, prior to formal acceptance in the group.

Scaffolding: An instructional practice in which the student receives intellectual, emotional, and social support while attempting a novel task. As the student becomes able to perform the novel task independently, the support is reduced and eventually withdrawn.

Second-year student: A student in the second year of study in a college or high school. At the college level, the second-year student will have earned 24 or more semester hours of credit.

Tectonic shift: A cognitive crisis brought on by a conflict with existing schema that builds cognitive pressure and requires a student to change these schema. The result is a significant change in epistemology.

Third-year student: A student in the third year of study in a four-year college or high school. At the college level, the third-year student will have earned 56 or more semester hours of credit and at least 112 grade points.

Role of Researcher

The university studied in this research was the primary researcher's employer at the time of the data collection and the analysis. His responsibilities included coordination of the first-year experience program at the target university, and he taught a section of the first-year experience seminar well. The program evaluation data for the first-year experience program provided the initial database for the study. He also taught one section of first-year composition each semester at the university and directed the writing center.

The primary researcher began teaching joint enrollment classes in 2002-2003 for a local community college while still on a high school faculty. This move was driven more by student demand than his own desire: the college preparatory English class he had been teaching had steadily lost enrollment to the on-campus community college English composition classes. In order to enroll and participate in the joint enrollment classes, the students were also required to make a 45 minute commute to the community college.

While the declining enrollment in the high school English class was a motivating factor for his taking on the joint enrollment classes, the students' commutes also took them out of other high school classes. This was beginning to have an effect on extra-curricular and co-curricular participation at his high school as well. The high school administration

asked him to take on the joint enrollment classes in an effort to meet the desires of the students and their parents and to preserve extra-curricular and co-curricular programming at the high school. The logical argument was persuasive, and frankly, the challenge seemed worthy, as well.

After a year of teaching the joint enrollment English composition classes at the high school, the primary researcher began to teach as an online adjunct for the community college, as well. In the online environment, he taught joint enrollment and community college students from around Iowa. After two years of this teaching, the opportunity came to move to fulltime community college teaching. His community college teaching load continued the dual enrollment classes in his erstwhile high school, and his college campus classes included regular community college students and joint enrollment students from other school districts. He also continued teaching the mixed online classes. Since moving to the private university level in 2007, he has taught primarily traditional college students, although high school students from the town high school occasionally mix in. For the first two years, he also taught an online composition class limited to dual enrollment students. He has not taught joint enrollment students since 2008.

When he began teaching the joint enrollment composition classes, he agreed with the view that the students might as well “get it out of the way” and save some tuition dollars at the same time. However, his readings in the area of general education at the college level, the liberal arts, and the effectiveness of credit-based transfer programs have led him to see some areas of potential conflict. This study was designed in part to help him begin to understand and define that conflict.

Besides his experience as a joint enrollment instructor, he served as a reader of the advanced placement English Language and Composition exam in 2007, 2008, 2010, and 2012. He has not taught any advanced placement classes, nor has he attended any of the professional development programs offered for the advanced placement programs. His high school administration asked him to attend an advanced placement seminar in 1995, and he was interested in developing an advanced placement class. Local budget issues prevented that from coming to fruition, and he had no further contact with advanced placement programs until 2007.

Chapter 2

Review of Literature

This study examined the intellectual development of first-year college students based on their participation in credit-based transfer programs. The *Learning Environment Preferences* (LEP) inventory placed the students on the Perry (1970) scheme of intellectual and ethical development. Credit-based transfer programs were defined as advanced placement or joint enrollment classes. Joint enrollment classes included classes that receive college credit while the student is still enrolled in high school. These classes could take place on the college or high school campus or online. The online classes may or may not have been supervised by a local high school teacher or other employee. Students enrolled in credit-based transfer programs should score higher on the LEP than regular program students.

The administration of the LEP used in this study was a part of the target university's assessment plan for the first-year experience program. The LEP data provided a measure of the students' intellectual development upon matriculation at the target university. All first year students completed the survey in their first-year experience program seminars during the first two weeks of the fall semester. A total of 254 students provided responses for the first-year program assessment, and of these, 239 were usable for the purposes of this study. This was the first year the LEP had been used at the target university for the purposes of program evaluation.

Measures of College Success

The common measures of success for colleges and college students, which are academic momentum, time to degree completion, and college GPA, all ignored reports

that college graduates do not meet the minimum skills expected (Bridgeland, Milano, & Rosenblum, 2011; Christensen, Horn, Caldera, & Soares, 2011; Tinberg & Nadeau, 2010). If the goal of a higher education system is to simply graduate students, or if the goal of a credit-based transfer program is to simply accumulate credit (Bailey, Hughes, & Karp, 2002), these common success markers would be sufficient. If academic productivity and a return on the public's investment in education (Reindl, 2006) were defined as helping to develop employees and professionals competent to work in the 21st century economy and to produce citizens able to continue the Jeffersonian tradition of self-government (Astin, 1993; Chickering, 1968; Schneider, 2011), or to advance the ability of students to think critically (King & Kitchener, 1994; Moore, 1994), then using persistence and degree completion as program success markers would seem inadequate (Christensen, et al, 2011).

President Obama's 2009 goal to have 75 percent of the American workforce complete at least a year of college was not mere credentialism. The President and American employers sought citizens and employees with the technical, critical thinking, and communication skills that the college credit is supposed to represent (Bridgeland, Milano, & Rosenblum, 2011; Christensen, et al, 2011). Kurfiss (1988) stated that colleges strive to produce graduates who can think critically. This critical thinking has included the ability to make judgments in complex situations on the basis of sound reasons, adequate evidence, and articulated values. Rather than using persistence and degree completion as the metric for success of credit-based transfer programs, the metric should be the ability of these programs to advance the intellectual development of students (Astin, 1993).

However, despite the desires and expectations of the designers of No Child Left Behind, intellectual transitions do not smoothly progress through the course of a single semester or even a year. Effective education induces an appropriate level of cognitive dissonance (Festinger, 1957), coupled with appropriate support (Vygotsky, 1962; cited in Chaiklin, 2003) to encourage intellectual and ethical development. The efforts to resolve the cognitive dissonance results in learning, and as learning accumulates, the stress on the students' epistemological models builds to a point that signals significant change.

Educators must realize that these transitions, when they come, do so not in a smooth progression, but as punctuated changes or points (King & Kitchener, 1994). These tectonic shifts appear to come more in the first year and fourth year of college than in the interim (W. S. Moore personal communication, June 27, 2011), which could have accounted for Arum and Roksa's (2011) failure to detect meaningful growth at the two-year mark in their study. The transitions in the first and fourth year of college may simply reflect the collective gathering of intellectual "pressure" and the release of that pressure. The metaphor of the tectonic activity for the transition in intellectual development represents not just the abruptness of the epistemological transitions, but also can reflect the emotional effects.

Disruptive Forces in Higher Education

The landscape of American higher education has changed more rapidly than it has since at least the influx of the military veterans following the end of WW II. The rapid expansions over the last decade of the 20th century and the first decade of the 21st century in proprietary education, online education, and credit-based transfer programs have changed and challenged what a college classroom is and who can be in it. A report from

the Center for American Progress identified online education as a disruptive innovation (Christensen, et al, 2011). According to this report, a disruptive innovation expands a market by reducing end user costs and easing the convenience of gaining access. Clearly online education fits that definition, and Christensen, et al. made that case well.

Credit-based transfer programs also fit that definition even better, as low income and at-risk students have enrolled in these programs in increasing numbers (Bailey, Hughes, & Karp, 2002; Hughes, Karp, Fermin, & Bailey, 2005; Swanson, 2008). According to reports published by the College Board (Hargrove, Godin, & Dodd, 2008), the advanced placement program has expanded its reach into a more “diverse student body” (p. 1). It is possible that this decision and effort by the advanced placement program were responses to the market competition posed by joint enrollment. While the research base examining the effects of advanced placement programs has been reasonably well-developed, increasing numbers of high school graduates have transferred credits from joint enrollment programs, with unmeasured consequences (Joint Enrollment, 2010). Clearly, credit-based transfer programs have been a disruptive, little-controlled, and poorly understood force in American education.

Measures and Motives Reconsidered

Most reports that have addressed credit-based transfer programs mentioned a set of common motivations and measures of success (Bailey, Hughes, & Karp, 2002; Delicath, 1999; Hughes, et al., 2005; Karp, 2007). These included increased access, especially for under-represented groups or students who might not otherwise consider college; an easing of the high school to college transition; savings of time and money for the students and families in pursuit of a degree; anticipatory academic socialization; and

increased rigor, opportunity, readiness, and engagement for high school students. The American Diploma Project (2004) found the quality and rigor of a student's high school preparation accurately predicted the likelihood of baccalaureate program completion, and some research indicated that joint enrollment has increased persistence rates and degree completion (Swanson, 2008; McComas, 2010). However, little is known empirically about the consequences of credit-based transfer programs for college student intellectual and psycho-social development. The reliance on completion and persistence as measures of success may prove a problematic metric for not only for credit-based transfer programs but also for the more traditional colleges and the innovators (Knapp, Kelly-Reid, & Ginder, 2011).

This increasing trend in access to credit-based transfer programs has been driven by many factors: the partnership of the community college and high schools in enhancing the students' fourth year, as was written into law in Iowa as Senior Year Plus (2009); the efforts to extend and expand access to career and technical education programs (Bailey, Hughes, & Karp, 2002); and the requirement for specialized teacher training and syllabus acceptance for a class to obtain an advanced placement designation. Skeptics have cited a number of less positive motivations, as well: the desire of high school students and their parents for "free" college classes, the desire to pad high school transcripts for college applications, the desire to circumvent college general education requirements (Bailey, Hughes, & Karp), and the need to bolster the college's financial balance sheet (Calhoon-Dillahunt, Farris, Ritter, & Roen, 2011). The metrics for success as credit-based transfer programs continue to grow will change as this innovation develops. Colleges need to play an active role in defining these new metrics to address concerns for academic success.

Critical Thinking Definitions

The definition and assessment of critical thinking has proven difficult, despite the nearly universal agreement that it is an important goal of college. Elder and Paul (2010), Brookfield (2012), and Kurfiss (1988) have proposed popular definitions, but the terms used indicate some disagreement. Also, few direct measures of critical thinking have been advanced.

Most high school and college faculty claim to teach for critical thinking, but are unable to articulate a definition or to describe accurate methods of assessing critical thinking. They assume that their methods of teaching advance critical thinking, but cannot demonstrate that objectively. This unarticulated critical thinking reverts to an unexamined, discipline-specific approach, in which the faculty assume that students can then generalize that disciplinary approach to other areas of their lives since the faculty have made that transition (Brookfield, 2012). Brookfield contended that the choice of a critical thinking tradition depended on the instructor's discipline and the ideology. This complicates discussion about the importance and methods of teaching students how to think critically. Few students can take the step to generalization without significant scaffolding, and only with great difficulty (Paul, 2004).

Critical thinking and the best ways to increase and improve the students' skills can be understood better using models of intellectual development. The holding power of dualism and multiplicity is so powerful that they may be as strong of as "core misconceptions" (Kurfiss, 1988, p 63). Kurfiss referred to these as logical fallacies of a high order.

Brookfield. Brookfield (2012) defined critical thinking as a process focused on uncovering and questioning assumptions, exploring alternative perspectives, assessing the accuracy of the perspectives and then taking informed action. Because assumptions guide our thinking about what is true, they also drive our epistemology. Assumptions usually reflect reality to some extent and depend on context for their accuracy. Intellectual development and critical thinking function to conform assumptions to a more appropriate relationship to reality. Under this definition of critical thinking, a student must have taken at least Perry position four before becoming capable of critical thinking, since the student must understand that a given situation may be examined from multiple valid viewpoints.

This model divided assumptions that into three categories: paradigmatic, prescriptive and causal (Brookfield, 2012). Paradigmatic assumptions provide structure for our worldviews by dividing it into categories. Examples of categories formed by this type of assumption include questions of morality and roles at work or in the family. These assumptions resist recognition and change because they seem self-evident and irrefutably true. A student in the early positions of Perry's scheme will likely hold more paradigmatic assumptions, although it is unlikely that even people in the upper ranges of Perry's scheme will be immune from this species of assumption (Brookfield).

Prescriptive assumptions dictate to us what should happen in particular situations, or how people and institutions should act toward each other. These extensions of the paradigmatic assumptions are less closed to change or reconsideration. Causal assumptions allow us to predict or plan behavior. Causal assumptions are the easiest to see as contextually based (Brookfield, 2012), and may provide an avenue for presenting

the students with the needed nudges to guide them toward the desired shifts in Perry position.

All disciplines begin with assumptions about what constitutes legitimate knowledge (Brookfield, 2012). These form the grammars, or the content and epistemology, of a discipline. Experts in a field codify these grammars. Content grammar is the accepted knowledge and procedures that a person must command in order to achieve competence in a field. Epistemological grammar is the accepted methods of arriving at truth in a field. In Brookfield's model of critical thinking, truth is not a collection of facts, but rather the system that decides which forms of discourse should be allowed. This system controls how the professionals in a given field are allowed by the field to talk to each other. According to Brookfield, disparate disciplines share common methods for determining what is true, despite apparent differences in the topics of their investigations. These similarities form the bedrock of critical thinking. However, this grammar can and does change. An obvious example is the conflict between quantitative and qualitative research methods in educational studies.

Brookfield (2012) identified five traditions in the development of critical thinking in the Western tradition. All of the traditions assume that intellectual openness is an inherent good. The goodness originates in the possibility that our assumptions may be ill-founded, or inappropriate in given contexts. Establishing a needed "disposition of openness" (Brookfield) in students in Perry (1970) positions two and three can be an important hurdle to overcome in intellectual development.

Students must be able to take positions five or six on the Perry scheme (1970) before this disposition of openness can become an integral part of the students' thinking

processes. When students have taken positions above six, this questioning process should become less stressful, since positions seven through nine indicate a growing commitment to a reasoned world view. The five traditions, according to Brookfield, are analytic philosophy and logic, natural science, pragmatism, psychoanalysis, and critical theory.

The first two traditions, analytic philosophy and logic and natural sciences, have been the most common in American schools and colleges. Analytic philosophy and logic focused on constructing and deconstructing arguments, recognizing fallacies and biases, and providing objective evidence for reasoning. Brookfield adopted this tradition when he advocated for questioning assumptions and attempting to verify their accuracy. While this can be viewed as a “safe” method of teaching critical thinking, analytic philosophy and logic’s focus on language can make it a politically charged exercise. Natural science, as an approach to critical thinking, focused on establishing cause and effect. The most common tool in this tradition has been commonly referred to in schools as the scientific method, which observes a context, posits and tests a hypothesis, repeats the observation to evaluate the hypothesis, and then reassesses the hypothesis for additional testing. Under this tradition, only after a hypothesis cannot be disproven can it be accepted as an assumption.

Pragmatism, with its focus on constantly questioning and testing of assumptions and attention to results, fits very well in Brookfield’s model (2012), which ended in informed action in pursuit of social good. Pragmatism’s informed action has been best viewed as experimentation intended to reveal errors and explore new possibilities. This tradition connected clearly to constructivism and viewed each student as a potential source of information and solutions. Students in Perry positions two and three need

careful scaffolding to trust and attend to their own and their peers' ideas as potentially viable, since dualists and early multiplists see authority figures as primary sources of knowledge (Perry, 1970).

Psychoanalysis has been more limited to the humanities and social sciences, since this tradition of critical thinking sought to help the student uncover their core personalities. Brookfield (2012) used elements of this tradition to ask the students to examine their own assumptions and those of their cultures. The goal here was to allow the students a place in which to question, select and integrate the assumptions that will allow them to self-actualize. The final tradition according to Brookfield, is critical theory, the tradition with the clearest connection to politics and therefore the most controversial. The central thrust of critical theory has been to question the assumptions that maintain a power structure or tradition. Because the assumptions that critical theory questioned frequently supported the paradigms of a culture, it can be very difficult for a student to risk invalidating them. If a student is below Perry position five, critical theory does not work well as a critical thinking approach, since the student must understand what a commitment to relativism means and be at least somewhat comfortable with it.

Paul and Elder. Paul and Elder have been the most popular proponents of the analytic philosophy and logic tradition of critical thinking in American colleges today. Elder and Paul (2010) stated that a single, agreed-upon definition of critical thinking is not required, as long as the working definitions agree on some basic points. These points stipulated that critical thinking ends in action, after systematic monitoring of thought. This monitoring must have considered the interpretation of facts and assumptions, have applied certain standards to assess the assumptions, and have considered the implications

and consequences of the assumptions (Elder & Paul). Paul (2004) defined critical thinking as “the art of thinking about thinking with a view to improving it”. Critical thinking must be consciously and intentionally developed by the student, and the pedagogy chosen for a given class can and will advance or impede progress in critical thinking (Elder & Paul).

The college faculty may, through their research activities, plausibly have a stronger conception and better tools for teaching critical thinking than teachers in primary and secondary schools. However, neither group has been able effectively to define or to demonstrate the ability to assess critical thinking. Paul (2004) stated that even college instruction aims for low-level thinking in instruction and assessment, and he advocated for teaching content through thinking, rather than thinking through content. His call has been echoed by others, notably by Mazur (1996) and his Peer Instruction approach, in which Mazur found his Harvard physics students could apply the formula to problems quite well, but could not articulate the meaning of the concepts that the equations and calculations illustrated. Paul indicated that critical thinking required thinkers to actively construct meaning from information. Only then could it become knowledge. Paul also claimed that only through critical thinking can a student understand a discipline. This disciplinary understanding requires a student to think of a problem from a new perspective. This new perspective will force a student in position two into position three, at least temporarily. With adequate scaffolding, this can trigger enough cognitive dissonance that the student begins to progress through Schlossberg’s (1981) transition stages.

Kurfiss. Kurfiss (1988) defined critical thinking as "an investigation whose purpose is to explore a situation, phenomenon, question, or problem to arrive at a hypothesis or conclusion about it that integrates all available information and that can therefore be convincingly justified" (p. 2), and continued, "[A]ll assumptions are open to question, divergent views are aggressively sought and the inquiry is not biased"(p.2) Kurfiss relied heavily on the analytic philosophy and logic described in Brookfield (2012). Kurfiss made clear that in thinking critically, justification of thinking processes is required due to the nature of ill-structured questions.

Kurfiss' model (1988) divided knowledge into three areas: declarative, procedural, and meta-cognitive. Declarative knowledge included all the facts and concepts in a discipline, and is the most frequently taught and tested. Procedural knowledge covered how to reason, inquire, and present knowledge in a discipline. Meta-cognitive knowledge, the least commonly taught knowledge, involved goal setting, discerning and satisfying the need for information, and assessing the value and effect of a line of inquiry. The first two areas of knowledge appeared to reflect the subject grammar of a discipline (Brookfield 2012). The quality of critical thinking depended on the ability to set aside assumptions and remain open-minded (Kurfiss). In this model, critical thinking may have resulted in action, although the student must have recognized that additional information may become available. Therefore, conclusions must remain somewhat tentative. This understanding is typical of Perry's position five.

As stated above, a college education has provided most students with gains in declarative knowledge. At least some students have failed to gain the desired procedural knowledge because professors have regarded it as "tacit knowledge" (Kurfiss, 1988 p.

iv), and did not teach it explicitly. Few students have made significant gains in meta-cognition, which requires integrating critical thinking, and persuasive and argumentative writing. This integration develops only after a great deal of exposure and practice in taking the positions characteristic of higher levels of intellectual development. Moral reasoning may depend on having reached more complex levels of intellectual development, since this mode of reasoning requires perspective-taking (Clinchy, Lief, & Young 1977; Kurfiss, 1988).

The assumptions used in encountering new knowledge, or when attempting to apply old knowledge in novel circumstances, can inhibit learning because these assumptions exert much cognitive power (Kurfiss, 1988). That is, students try to fit new knowledge into existing assumptions. When this fails, students must revise these assumptions. This revision can trigger a shift in intellectual development position, if the cognitive tension is sufficient. Kurfiss stated that different disciplines value different thinking skills, noting that novices attempting to solve problems in a discipline tend to avoid applying the discipline's principles to problems before attempting to solve them. This may depend on depth of subject knowledge versus general knowledge, or because students are not comfortable enough with their existing knowledge. On the other hand, experts in a discipline resort to the discipline's epistemology in to structure the problem's question, and then inventory their content knowledge prior to proposing a plan to solve the problem. Kurfiss pointed out that professors rarely directly or clearly teach critical thinking or the processes of their disciplines, displaying the product instead of their discipline's critical thinking processes. Also, Kurfiss stated, the professors tend to fail to fully describe the accepted forms of presentation to the students.

In other words, the faculty have focused on content grammar and apparently assumed the students would absorb or discover the epistemological grammar. Since the faculty have failed to teach this mode of thought, the students have failed to learn it. Like most people, the faculty typically assumed their epistemologies as second nature and, as they focused on the day to day teaching and research, failed to consider that it was novel to students. Since faculty did not teach the thinking, they did not test it. Since it was not tested, the students did not see it as worthy of learning or practicing. This conflict of expectations between students and faculty forms an excellent example of the checkers and chess issue that Johns (1993) wrote about. If students do not practice taking a different intellectual development position, it cannot become second nature. If it does not become second nature, it cannot be available for transfer to other areas of the student's life.

McPeck (1981) claimed transferability ignored the specialized knowledge required to use critical thinking in a field. Toulmin (1957) argued that universal evaluation of an argument did not work, since the required knowledge must be discipline-specific. These points reinforced Brookfield's (2012) subject or discipline-based grammars: the content and epistemological grammars. Because of the time, reinforcement, and practice needed to operationalize content and epistemological grammar (Kurfiss, 1988) expecting college students to independently use critical thinking may be foolhardy or unrealistic. In order to reach this effect-use threshold under Kurfiss' model, students must have prepared for shifts from dualism or early multiplicity to relativism. The students must then have become comfortable in these new intellectual positions before attempting or being able to integrate the critical thinking skills.

Reliability and Validity of Moore's Learning Environment Preferences

Efforts to measure critical thinking and intellectual development have stumbled on the problem of clearly defining this concept. Efforts to accurately place students within intellectual development positions began with Perry's initial research (1970) and have explored various approaches with varying success. These efforts have ranged from essay-based instruments to recognition instruments.

In 1975, Knefelkamp and Widick developed the *Measure of Intellectual Development* (MID), the first non-interview-based instrument to measure Perry positions (Evans, et al., 1998). The MID addressed only the first five Perry positions. Baxter Magolda and Porterfield (1985) followed with the *Measure of Epistemological Reflection* (MER), which also measured the first five Perry positions. Both the MID and MER were production instruments, which required considerable training, attention to inter-rater reliability, and time to score. In the MER, participants responded to 28 open response questions regarding (a) decision-making procedures, (b) preferences for focus of classes, (c) preferences for professors' teachings styles, (d) relationships and interactions within classes, (e) effectiveness of hard work, (f) course evaluations, and (g) how to resolve conflicting opinions from experts. The MER should take about an hour to complete but could easily take more time for people with more complex intellectual development positions (Baxter Magolda, M. B. personal communication June 25, 2011). Scoring also posed significant issues, since the MER required two trained raters, who must have established inter-rater reliability prior to scoring the instruments. To preserve inter-rater reliability, raters must have recalibrated prior each scoring session, a concern for the MID, as well. Because of these factors, in 1983 Erwin developed the *Scale of Intellectual*

Development to provide a more readily usable instrument. However, the SID modified the Perry scheme, rendering the instrument of questionable value (Evans, et al., 1998).

In 1989, Moore developed the *Learning Environment Preferences* (LEP). The LEP measured positions 2-5 and was designed on analyses of the MID's most common rating criteria, based on a multi-year examination of the MID essay responses (Moore, 1989). The constructed response items on the LEP were intended to reveal increasing Perry positions, up through Perry position 5. Positions beyond this level, according to Moore, can only be observed through qualitative methods.

The LEP, like the MID, asked the students to consider the characteristics of their ideal learning environment. The initial LEP items were matched to Perry positions by two trained MID raters, who worked separately to ensure validity (Moore, 1989). Items rated more than a position apart by the raters were discarded, and items rated in sequential positions were revised for clarity or also discarded. Pilot testing and qualitative research about the phrasing of the items also provided evidence of item validity. Moore's pilot testing included items not keyed to a Perry position, but which sounded complex. This helped to determine if participants were responding to items based on the perceived complexity of the item, rather than their personal preferences in the learning environment.

Moore (1989) reported Cronbach alpha coefficients of .72 for position three, .81 for position two, and .84 for positions four and five. Inter-correlations were good for items indicating positions two, four, and five. Moore's testing indicated that position three may lack clarity in the items and could benefit from additional conceptual work. His findings indicated a possibility of a parallel among the LEP items for positions three

and five, and that this may have contributed to a lower alpha for the position three items. Because participants in a constructed-response study tend to select central factors of a Likert scale over higher or lower values, Moore chose to compare the LEP with another accepted measure of the Perry scheme. Since the MID had the widest acceptance as a measure of the Perry scheme, Moore randomly sampled his population for an additional assessment using the MID and found a correlation with that instrument of .36, suggesting a “conceptual overlap” between the two instruments. The difference in format of the instruments may have reduced the correlative effects, as early comparisons of constructed and production response surveys, such as the DIT and other Kohlberg systems, found similar levels of correlations.

Moore (1994, 2002) pointed out that a body of assessment literature exists that applied qualitative methods to assess complex learning, and that student self-reports have been an important part of this approach. If a student were persuaded of the importance of the assessment, self-reports may be the best measures of shifts in a student’s epistemology. Moore acknowledged that, in the heavily politicized environment of educational assessment, this qualitative approach has met with difficulty in making headway (Merriam, 2009). This difficulty does not negate the truth of the literature or the accuracy of the assessments.

The reports that college has had little effect on the critical thinking skills of students (Arum & Roksa, 2011; Pascarella, et al., 2011) have met with similar criticism (Haswell, 2012), based on the chosen instruments and the allegedly faulty methodology of the studies. Given the difficulty of arriving at a single accepted definition of critical thinking, the idea that a recognition task can capture as complex a characteristic as

critical thinking may cause skeptical reactions among some scholars (Pavelich, Miller & Olds, 2002). Pintrich and Hofer (1997), while acknowledging the advantages of survey instruments over interviews, commented that measuring a continuum with a survey consisting of extreme positions may be problematic. Moore (1989) acknowledged this difficulty when he pointed out that several items on the LEP correlated with more than one position on the Perry (1970) scheme. However, the LEP performed as well as other instruments, including those that involve production tasks. The LEP did not require specialized training for raters and could be scored quickly.

Pintrich and Hofer (1997) recognized the LEP as a common measure of the Perry scheme and critiqued it, pointing out that the sections and items on the instrument dealing with the classroom and teaching (see Appendix C) did not seem to correlate with positions on Perry's scheme. They did acknowledge that conceptions of "learning, teaching, and knowledge are probably intertwined" (p. 116), reducing the impact of that critique. However, the preferences regarding the classroom and the role of the teacher and classmates illuminated assumptions about the source of knowledge and its acquisition. In developing the LEP, Moore (1989) was not extending Perry's scheme, but attempting to measure what had been described. Indirect measures can pose challenges, but they can be helpful. Moore himself recognized that the LEP imperfectly addressed the entire Perry scheme. Pintrich and Hofer, while acknowledging the advantages of survey instruments over interviews, commented that measuring a continuum with a survey consisting of extreme positions may be problematic.

Common measures of quality in higher education such as the Collegiate Learning Assessment (CLA), the Collegiate Assessment of Academic Proficiency (CAAP), the

National Survey of Student Engagement (NSSE), Your First College Year (YFCY), and the Cooperative Institutional Research Program (CIRP) were not geared to examine the Perry (1970) positions, and were therefore inappropriate for this study. The NSSE was designed to assess a large range of engagement issues, focused on institutional improvement and performance (Kuh, Kinzie, Schuh, Whitt & Associates, 2005). These instruments did include some items that purport to measure some aspects of critical thinking or engagement in classes, but none were designed to measure intellectual development as defined in this study.

Need for Standards for Credit-based Transfer Programs

If researchers could describe the actual consequences of credit-based transfer programs, stakeholders could develop policies to help ensure the best outcomes (Calhoun-Dillahunt, et al, 2011; Iowa Department of Education, 2011). If credit-based transfer programs fail to adequately induct the students into the culture of academia or to help them transition into a new position of intellectual development, attrition rates could remain at their current unacceptable levels or even worsen as the trend toward credit-based transfer programs continues. Credit-based transfer programs could actually harm persistence rates if the hoped-for anticipatory socialization and greater intellectual development prove insufficient to prepare the students to enter the second or third year classes for which they are supposed to be qualified. To help address these concerns, the National Alliance of Concurrent Enrollment Partnerships (NACEP) has established standards in curriculum, faculty, students, assessment, and program evaluation. The standards address (a) curriculum rigor, (b) faculty selection and development, (c) student enrollment and admissions, (d) assessment standards and rigor, and (e) student and

program evaluation (Standards, 2011). NACEP began accrediting joint enrollment programs in 2004 (Mission and History, 2011). States are beginning to require that joint enrollment programs obtain this accreditation.

NACEP has intended to require standards for the joint enrollment programs, specifically those taught in the high school milieu, due to serious concerns about these classes. The College Board, which owns the advanced placement tests, has also established standards for the teachers (2005) and the curriculum taught (The Review Process, 2010). Before the College Board will allow a course to be designated as advanced placement by a school district, the teacher must have submitted the syllabus for review by trained college faculty to ensure that the materials and the approaches meet College Board standards. The course standards were set by committees of high school and college faculty (The Review Process) and meet or exceed the peer review process in place at most colleges for course syllabi for joint enrollment or courses devoted exclusively to college students.

The advanced placement teacher standards are not requirements, since hiring and staffing decisions are beyond the rights or responsibilities of private organizations (College Board, 2005). These standards include a minimum of three years in the classroom, which is more than most colleges require for beginning faculty members or adjunct instructors, and also an advanced mastery of the material to be taught. The College Board identifies mastery as a bachelor's in the field to be taught, ideally a master's degree, and state certification. National Board certification was preferred for advanced placement teachers. According to the College Board standards document, approximately 70% of advanced placement teachers held the master's degree in 2005.

Annual professional development for advanced placement teachers was also highly recommended (Hargrove, Godin, & Dodd, 2008), and advanced placement Institutes have been offered annually in several locations around the nation. These programs have been both accessible and robust.

The standards for advanced placement teachers, which do not have any regulatory weight behind them, have equaled or exceeded those of most beginning graduate teaching assistants (College Board, 2005). These teaching assistants are the college instructors most likely to be assigned to the first-year level classes. Indeed, this level of scrutiny would meet with resistance in most traditional colleges as an infringement on the academic freedom of faculty.

State Policies

Even as states encouraged the expansion of credit-based transfer programs in an effort to economize and accelerate education (Calhoun-Dillahunt, et al., 2011) a survey of state policies (Karp, Bailey, Hughes, & Fermin, 2005) found that many states had significant gaps in published policies regarding credit-based transfer programs, especially joint enrollment. For example, only eight states required the instructor to carry credentials equivalent to the college level and two more required that the instructors receive college approval. Professional development was required of high school instructors in two other states, and 38 states had no published policies regarding who could teach joint enrollment. Thirty-five states had no policies on course content, while seven required state approval, five required college approval, and three required both state and college approval (Karp, Bailey, Hughes, & Fermin).

Admissions Issues

According to Karp, Bailey, Hughes, and Fermin (2005), policies regarding admissions to joint enrollment were as varied as the milieu. Twenty states remained silent regarding who could be admitted to joint enrollment, while seventeen states reserved that decision to the state board of education, a decision that reflected the assumptions from the Iowa Education Summit (2011) that colleges have struggled with the changing student body (Christensen, et al, 2011). Eight others gave that power to the colleges, while four gave K-12 institutions the right to control admissions to joint enrollment (Karp, Bailey, Hughes, & Fermin, 2005). In one state, the decision was held jointly between the college and the school district.

If the colleges do not have a strong voice in who can enter their classrooms, they have effectively lost control of the ability to create the desired and required learning environment (Taczak & Thelin, 2009). Admissions decisions should be retained as close to the action as possible, unless a pattern of discrimination can be shown. This would place the decision in the college's hands or at least require collaboration between the college and the K-12 schools. Results from a University of Texas-Pan American self-study found that students who had experience in credit-based transfer programs persisted to graduation at higher rates, earned higher GPAs, and graduated at higher rates (Hinojosa & Salinas, 2012). The study did not report the results of statistical testing, although the comparability groups were reasonably close in size.

Negative Effects on Liberal Arts

As increasing numbers of students from credit-based transfer programs matriculate with many general education requirements already met, these programs may

have inadvertently limited the students' exposure to a coherent liberal arts curriculum and their opportunities to explore majors. Many high school graduates and their parents have indicated a desire that post-secondary education focus on proposed majors and students have wanted to avoid paying for or taking general education classes. General education classes are intended in most colleges to provide students with at least some college-level exposure to the liberal arts (Christensen, et al, 2011) and the more advanced thinking in various disciplines characteristic of a college-educated citizen (King & Kitchener, 1994). This exposure can help the students find a career in a field they might not have considered, and, in the process, it may lead to the intellectual transition that a strong self-authorship (Baxter Magolda, 2001) decision can help develop. In the conflict between the students' motivations, the tradition of the liberal arts, and critical thinking imperatives, colleges can find it difficult to develop that necessary exposure.

Advising Issues

Additionally, many high school guidance counselors have not always been able to provide adequate college advising (Hughes et al, 2005). Many states allow high school students to enroll in whatever joint enrollment classes that interest them, and the college faculty may not even know their enrollment status (Hughes, 2010). This inadequate advising and lack of enrollment information means students may not obtain the advising required to construct a coherent liberal arts base for their education (Kuh, Kinzie, Schuh, Whitt and Associates, 2005; Swanson, 2008). Left with this chaotic bag of puzzle pieces (Kuh, et al), students become more likely to drop out (Tinto, 1987) or at least fail to make the desired intellectual development gains. Kuh, et al, identified an "importance of coherence in learning" (p. 109). This coherence emphasizes the need for student's chosen

college to work closely, even in tandem, with the institutions offering credit-based transfer programs. This level of cooperation has not happened frequently, leaving the students to make meaning of their credit-based transfer classes alone. This becomes even more difficult when the students are unaware that these connections are a needed or important learning task.

In the event that a high school counselor might desire additional background or information for advising high school students in selecting joint enrollment classes, the National Academic Advising Association (NACADA) has had no resources to assist in helping this increasing student population to make the best possible decisions. This has been a continuing problem. Until students can be shown the need for the liberal arts, they are not likely to value them: many students have sought credentials, and they have sought them as a consumer would (Christensen et al, 2011).

Concerns have flowed in the opposite direction, as well. Well-meaning school officials sometimes have advised especially low-income or academically challenged high school students against enrolling in credit-based transfer programs (Western Interstate Commission for Higher Education [WICHE], 2006). Other motivations, including school finances and high school class enrollment concerns, may have driven school officials to discourage joint enrollment, to the detriment of individual students who needed and might thrive on the additional challenge provided by credit-based transfer programs (Nathan, Accomando, & Fitzpatrick, 2005). All of these advising issues in high school may have negatively affected the academic preparation and intellectual development of first-year college students.

Besides these concerns at the high school level, increasing the number of students matriculating with earned credit has posed policy challenges at the college level, as well (Zunkel, et al. 2011). Colleges using the learning community model have found that students interested in this model may have already taken the learning community courses, thereby removing themselves from the support and networking of the community. Since a student's financial aid can be tied to their classification within the college, entering the aid system with increased levels of credit has effectively placed them out of competition for funds awarded at the institutional level (Zunkel, et al.). Students who would not otherwise earn admittance to a university have used their transfer student status as a proxy for acceptable test and class rank standards (Iowa Department of Education, 2011; Zunkel, et al.) Because of these policy challenges, colleges and universities should evaluate and track the success of students who matriculate with credit-based transfer program credits.

Remediation Questions

The rise of credit-based transfer programs in American high schools and the academy came at a time of increasing demand for remedial or developmental education as more and more under-prepared students accessed post-secondary education (Karp, 2007). ACT scores for placement in developmental or remedial classes are determined by the individual institutions and range from 20 on Math and 19 on English to 16 on Math and 15 on English (The ACT Test Data, 2011). Rutschow and Schneider (2011) reported a study that found "a decrease in the likelihood of remediation" (p.20) for joint enrollment students, which is an encouraging point, if it means that the need, and not just the enrollment in these programs, has been reduced. Some evidence has indicated that

these low-achieving high school students benefit from the challenges of joint enrollment (Kim, 2006; Reindl, 2006), while others have contended that the joint enrollment programs cannot adequately provide education to students who are not immersed in the “intellectual life of the college” (Calhoun-Dillahunt et al, 2011; Bailey, Hughes, & Karp, 2002).

This intellectual life has been a part of the purpose of the general education curriculum that has made up the bulk of the credit-based transfer programs. The stakeholders in higher education must come to common agreement on the purpose of the general education courses (Calhoun-Dillahunt, et al., 2011).

Students who take a “watered down” joint enrollment class and pass it may skip a class that they need to progress in intellectual development. With national ACT scores averaging just above the upper limits of these cut scores (The ACT Test Data, 2011), and with the push for increasing access across demographic groups in all types of credit-based transfer programs, this has become a cause for concern. This is why Joliffe and Phelan (cited in Anson, 2007) advocated for advanced placement of matriculating students, and against avoidance of the required general education class at the matriculated institution. Given the worries about joint enrollment quality in the high school milieu and in high schools in general, it may be the case that a student may pass the credit-based transfer class and still score in the developmental range for full-time college experiences.

After studying the critical thinking skills of students after two years of college and following graduation, Arum and Roksa (2011) found that students had not advanced in critical thinking skills significantly. Pascarella, Blaich, Martin, and Hanson (2011) stated that a 2005 study by Pascarella found a full standard deviation increase in critical

thinking over four years of college. To resolve these conflicting findings, Pascarella, et al. (2011) re-examined the Wabash National Study (WNS) data and found low level of changes in critical thinking or other important academic success measures at or near the levels that Arum and Roksa (2011) found. Pascarella, et al. actually noted a decline in some measures over four years and concluded that the controversial findings by Arum and Roksa should not be rejected out of hand.

While the authors of these studies did not speculate on the reasons for these disappointing results, the increasing credit-based transfer program enrollments may have contributed by failing to adequately prepare these accelerated students, a view suspected by Anson (2010). This result may originate in the reluctance of college faculty to talk about moral and ethical issues because those are allegedly outside the scope of their subject matters (King & Kitchener, 1994). The faculty avoid doing this to avoid being drawn into public battles that would lead to their being accused of undermining community values (Bloom, 1987).

Credit-based transfer programs may have misled students regarding academic expectations in, and their academic preparation for, college classrooms (Iowa Department of Education, 2011; Taczak & Thelin, 2009). These lowered and inaccurate expectations may have caused students to reduce or fail to change their efforts in the classroom during their first semesters, limiting the growth and benefits of higher education for these students and possibly resulting in reduced academic achievement.

The benefits students derive by “taking care of” some college general education classes prior to high school graduation have posed a concern, since writing (Hansen & Farris, 2010) and critical thinking (American College Personnel Association, 1996;

Cohen & Kisker, 2010; Arum & Roksa, 2011) are vital for academic success. Schneider (2011) stated credit-based transfer programs students have self-reported that their preparation is superior to their college classmates. Too high a comfort level with current skills can have a negative effect on the additional growth needed for a successful liberal arts education. On the other hand, Denecker (2007) stated that faculty have reported that this self-confidence in the credit-based transfer program students has proven to be founded. This confidence in the joint enrollment students, according to Denecker, grew as the semester went on. This could be an indication that the credit-based transfer program students are feeling the effects of having made transitions intellectually and socially.

However, the disappointing results reported by Taczak and Thelin (2009) indicated that many students may not be transitioning through intellectual positions. While the intention of credit-based transfer programs has been to better prepare students for the intellectual rigors and social expectations of college (Karp, 2007), the little empirical research to date has not investigated adequately the positive effect of these programs regarding intellectual development (Tinberg & Nadeau, 2010). Self-reports do not provide empirical evidence for the growth claimed by advocates of credit-based transfer programs. When students fail to transition in these positions, their attrition rate may increase, despite claims of an increased understanding of the roles and expectations for college students (Karp; Uhlenkamp & Glenn, 2011). A successful transition to college means that students have the support and strategies to allow for satisfactory self-authorship (Baxter Magolda, 2007) and to make the desired intellectual development transitions.

Data Infrastructure Problems

Several studies have recognized the need for a more robust student data infrastructure (Bailey, Hughes, & Karp, 2002; American Diploma Project, 2004; Hargrove, Godin, & Dodd, 2008; Reindl, 2006) to aid in tracking and reporting success measures from K-12 through the post-secondary levels. These studies have failed to offer plans as to the methods or even shape of such a system. Ideally, this would provide transparent views of a student's K-12 curricular and co-curricular record and would track that student through any subsequent undergraduate and graduate education. The more information that the educational system has about a given student, the better that student can be served by the system. Additionally, this tracking should follow across state lines, regardless of the control of an institution, including public and private education.

Transfers, multiple enrollments or “swirling”, and stop outs have posed significant challenges to such a system. These challenges notwithstanding, a transparent data system such as this would enable schools at all levels to more accurately define success and improve their performances on these measures of success.

Reindl (2006) reported a desire among participants to avoid isolated efforts to accelerate learning in favor of coordinated efforts based on “hard data” (p.4). This desire is of course understandable and desirable but neglects the fact that game-changing innovations can and do occur in isolated efforts based on “educated hunches and case studies” (p. 4). As this robust infrastructure develops, the door must remain open for individual or local efforts to innovate to increase access and success.

Milieu of Joint Enrollment

Studies have called for additional studies to examine joint enrollment in light of milieu and student background (Rutschow & Schneider, 2011). While this study cannot deeply examine the high school backgrounds of students due to the data infrastructure challenges discussed above, the parsing of credit-based transfer programs into two categories, advanced placement and joint enrollment, will begin this more rigorous analysis. The subsequent examination of joint enrollment classes by milieu may yield clearer insights.

Appendix A defined thirteen different milieu of joint enrollment programs found in American schools in one degree or another. The milieu were divided by location: on the college campus, on the high school campus, or online. These three categories were further divided by the type of faculty teaching the class: full time college faculty and staff, adjunct faculty, or high school teacher. The online classes were further distinguished by the existence and source of monitoring of the student's progress. Advanced placement classes were, by definition, high school classes on a high school campus taught by a high school teacher, although joint enrollment classes can also fall into this milieu.

Little research has been executed on the quality of educational results that characterize these various milieu (Brown Lerner & Brand, 2006; Denecker, 2007; Smith, Miller, & Bermeo, 2009), although this could be a fertile field. Brown Lerner and Brand cited Lieberman's claim that the students attending credit-based transfer programs on a college campus had easier access to the college support and other resources than students who took the classes online, at the high school, or on other campuses. This adequate

academic support is vital for success, especially as students negotiate the transitions to the college classroom (Kuh, et al, 2005). Kuh, et al stated two keys to student engagement: the time and effort the students put into studying and activities designed to lead to college success, and how the institution allocated resources. This resource allocation extends to the choice of milieu and how the college arranges, ensures, and assesses student participation in learning activities, be they curricular or co-curricular. When high school students enter a college campus for only one or two classes and then leave, or when they are still immersed in the high school activities, the engagement required for college success (Astin 1993; Pascarella & Terenzini, 1991; Tinto, 1987) likely becomes more problematic.

In addressing location of the joint enrollment classes, only four states required the classes be held on the college campus (Karp et al, 2005), and the rest of the states were evenly split between allowing the classes on in either location or remaining silent on the question. In a recent CCCC survey, 37% of respondents reported that joint enrollment classes were designed by the college but delivered on a high school campus by a high school teacher (Calhoon-Dillahunt, et al, 2011). In some states, the proportion of high school milieu classes has climbed as high as 77% (Joint Enrollment, 2010).

Based on the lack of research that characterizes credit-based transfer programs, it is likely that when colleges elect or agree to have joint enrollment classes on the high school campus or online, it is a decision driven by *ad hoc* issues of scalability (Christensen et al.2011), convenience (Denecker, 2007), or revenue (Bailey, Hughes, & Karp, 2002; McClure, Emerson, Johnson, Lipetzky, & Pope, 2011) rather than careful program development. If the high school teachers can “cover” the class, the reasoning has

gone, that reduces the need for the college to find and hire faculty. In some states, that has also shunted state aid dollars to the college (Calhoon-Dillahunt, et al, 2011), has provided additional funds to the schools for sharing resources (Bill Taylor, personal communication, July 3, 2011), or both (Bailey, Hughes, & Karp, 2002, 2004).

The fact that more rural high schools have offered joint enrollment classes than advanced placement (Swanson, 2009) on their campuses is of some concern, since these smaller schools have tended to have less robust curricula, fewer local support services, and less experienced teachers. Additionally, the local support services that do exist may not have been organized to provide effective college-level support (Kuh, et al, 2005). In discussing an additional problem with high school-based credit-based transfer programs, Calhoon-Dillahunt et al (2011) also reported that college instructors mentioned the frequent interruptions and disruptions common to the high school environment as significant distractions from providing adequate instruction, a concern that was acknowledged as early as 2002 (Bailey, Hughes, & Karp), but which has yet to be addressed. This would obviously pose a challenge to the high school classes, as well.

Time and focus on intentional curricular and co-curricular activities has contributed more than other factors to success and personal development (Kuh, Kinzie, Schuh, Whitt & Associates, 2005; Pascarella & Terenzini, 1991). This intentional engagement at the level required for successful transitions to college has been made more difficult when the class was in the high school milieu, especially if the high school teachers were not explicitly made aware of the need to engage the students at a more appropriate level.

Another factor in the popularity of joint enrollment among high school students may be found in the perception that, besides being a guaranteed college credit, some joint enrollment classes may actually have been less academically demanding than the advanced placement classes, (Denecker, 2007; WICHE, 2006). This preference for a less demanding, guaranteed credit could have resulted in even talented students graduating from high school with a lower intellectual development position than if they had enrolled in a joint enrollment program away from their high school or an advanced placement class at the high school. However, regardless of milieu, the literature has lacked firm evidence “whether credit-based transfer programs actually achieve their goal of helping students enter and succeed in college” (Hughes, Karp, Fermin, & Bailey, 2005 p. 53), a problem that has been noted elsewhere (Tinberg & Nadeau, 2010), and that has been rooted in the lack of a robust data infrastructure.

Some have cried foul on the universities who decry the educational quality at community colleges (Iowa Department of Education, 2011), yet who have staffed joint enrollment classes with master degreed or certified high school teachers working toward their masters. At the same time, those same universities have employed teaching assistants, frequently fresh from the baccalaureate ranks themselves, to teach the same classes, sometimes with little regard for the assistants' pedagogical training (Burke, J. personal communication, 6 June, 2012). At the same time, the full-time college faculty undoubtedly have a stronger disciplinary basis and their active research agendas keep them on the cutting edge of their disciplines. In very successful colleges, the faculty have involved undergraduates in their research and other work, so the students understand that they are at the center of the professor's work (Kuh, et al. 2005) However, this becomes

difficult in the high school milieu, since most high school teachers have no research or professional agenda, or if the faculty are largely adjunct, or “freeway flyers”. These categories of staff have become the most common staffing solution for credit-based transfer programs.

Also, many college adjunct instructors carry the same degrees as the full-time, tenure track faculty or have the advantage of having applied professional experience in the academic areas in which they teach. However, the lack of consensus on what advances a student in intellectual development reduces their claims to pedagogical superiority when compared to pedagogically trained high school instructors at the underclassman levels. When this lack of consensus is coupled with the varying levels of pedagogical training that many full time and adjunct faculty possess, the potential quality difference increases. This is another area in which little empirical investigation has occurred.

Changing Mission of Community Colleges

In Iowa, the trend has become clear: serving high school students is becoming increasingly a central mission of community colleges (Joint Enrollment, 2010). The percentage of joint enrollment headcount enrollment at Iowa’s 15 community colleges in 2009 ranged from a low of 16.37% to a high of 38.8%, and the number of credit hours awarded through joint enrollment ranged from a low of 5.9% to a high of 21.6% (Joint Enrollment, 2010). Given the concerns about the high school milieu, this is worrisome, since 77.9% of the joint enrollments in Iowa in 2010 were in contracted courses (Joint Enrollment), and this rate was only slightly higher than the national average (Tinberg & Nadeau, 2010).

The nation's community colleges have been asked to help bolster the rigor and offerings of high school curricula (Iowa Department of Education, 2011). This additional challenge has become especially needed in rural districts, which can have difficulty staffing and filling more-advanced core classes.

Some colleges boosted their enrollment figures using joint enrollment to order to gain more state funding (Spillman, 2011). The added enrollment helped to fund other programs without raising tuition or fees. These colleges attempted to keep the joint enrollment offerings revenue neutral by placing the joint enrollment in the high school with high school faculty. In an effort to maintain quality control, some of these colleges have begun to institute rigorous training and monitoring regimens for joint enrollment instructors (Denecker, 2007; Spillman).

Developmental Questions

The establishment of NACEP represented a concerted effort to address concerns about the quality of the education provided by high school teachers in the joint enrollment classes. This concern of the quality in credit-based transfer programs has focused on academic issues, but nothing in the NACEP standards specifically has spoken to the psycho-social transitions or intellectual development. The credit-based transfer programs students may have experienced good anticipatory socialization on the academic side (Bailey, Hughes, & Karp, 2002; Merton, 1957, cited in Swanson, 2008), but they cannot have practiced realistic role rehearsal if the classes were located in and taught by faculty they recognize as high school (Brown Lerner & Brand, 2006; Tinberg & Nadeau, 2010). This issue has arisen in high school-only classes on the college campus, as well (Denecker, 2007).

Transition theory states that the younger a group of people is, the more similar they will be (Schlossberg, 1981). However, as the college-going population has diversified and more students from underserved populations have accessed higher education, the relative homogeneity of the matriculating students has diminished. This newer cohort of students has tended to have more developmental issues, even as they were targeted for credit-based transfer programs. These factors must be taken into account, as must the distinct possibility that the typical first-year student may not be developmentally ready to “perform sophisticated mental functioning” (Kloss, 1994), and some few will not make the desired transitions. This issue is discussed in greater detail below.

If credit-based transfer classes are taught in the high school milieu (Denecker, 2007), a subtle but significant barrier has not been crossed. This barrier may prevent or delay high school students from experiencing the tectonic shifts that can characterize transitions in intellectual development positions. Especially in credit-based transfer programs in the high school, the students’ epistemological assumptions may not be questioned. If this is the case, the needed transitions (Schlossberg, 2007) do not occur, or if they do, they are “seamless”. Indeed, the removal of the seams between high school and college has been a goal of credit-based transfer programs (Denecker), even as they may have failed to meet this goal. However, those seams may serve a vital purpose.

A seamless transition may pass unnoticed, and according to Schlossberg (2007), if the person failed to identify an event as a transition, it was not in fact a transition: the needed shifts will not have occurred, to the possible detriment of the student. This concern has been raised in the field of college composition, which has become vocal about the

quality of the learning and maturing which students experience (Schneider, 2011). Taking the 2010 Iowa report again as an example, English composition and speech accounted for 19.5% of all contracted classes, with 14, 245 students enrolled (Joint Enrollment, 2011). Business and industry have mentioned communication skills as a problem area in college graduates (Christensen, et al., 2011). The focus of credit-based transfer programs on writing has been problematic, to say the least.

Scholars and practitioners have questioned the intellectual maturity and readiness of high school students to achieve college-level work (Anson, 2011; Denecker, 2007; Schneider, 2011). High school-type behavioral problems encountered in the credit-based transfer program classroom have been cited as evidence of this immaturity and unpreparedness (Calhoon-Dillahunt, et al., 2011; Taczak & Thelin, 2009). Based on their qualitative study, Taczak and Thelin specifically questioned the intellectual development positions of high school students, as defined by Perry (1970). Others have questioned the quality of the instruction itself in this milieu (Bailey, Hughes, & Karp, 2002; Reindl, 2006).

Academic Momentum

Swanson (2008) reported that dual enrollment did not have a significant impact on academic momentum as measured by the attainment of 50 hours by the end of the second year. Swanson also found that joint enrollment did not decrease time to baccalaureate completion for males or Hispanics. High performing students were among the only groups to decrease time to degree. Since these students were more likely to achieve a baccalaureate degree regardless of credit-based transfer program participation, it appears that these programs did not have an unusually positive effect in achieving this goal. Joint

enrollment participation did, however, appear to increase the chances of low-income students to earn an associate's degree (Swanson). This may indicate that joint enrollment could be used as a tool to help the poorest quintile improve their earning potential (Karp 2007), and by extension, improve their lives.

High school course loads and class rank positively correlated with academic momentum, however (Swanson, 2008). This finding could indicate that challenging high school curricula, such as credit-based transfer programs, may lead to greater credit and higher degree attainment. Swanson speculated that students who participated in credit-based transfer programs saw no negative consequences to failing to maintain academic momentum. Another study found that these programs have in fact helped to maintain academic momentum (Mead, 2010), but this study will not address these conflicting findings. Academic momentum obviously has many influences, and it is possible that students have goals in attending college other than the degree. These alternative goals notwithstanding, credit-based transfer programs should advance the students' transitions in intellectual development, thereby helping to remove an obstacle to academic momentum. Thus far it appears that no researcher has addressed relationships among these issues.

Advanced Placement Performance in College

Advanced placement test performance has been correlated with success in college academic tasks (Hargrove, Godin, & Dodd, 2008; Mattern, Shaw, & Xiong, 2009), and regardless of success on the exam, advanced placement students have been more likely than non-advanced placement students to earn a B average in the first year of college. This may argue for transitions in intellectual positions on the part of advanced placement

students, if college grades can be trusted as proxies for intellectual development. Mattern, Shaw, and Xiong left out the question of motivation, both intrinsic and extrinsic. The data from College Board has been clear that advanced placement courses help prepare students for successful college program completion within the standard reporting period of five years for a bachelor's degree. Mattern, Shaw, and Xiong notwithstanding, Swanson (2008) reported findings that advanced placement students earned more associates' degrees and fewer baccalaureate degrees than joint enrollment students, but those who earned baccalaureate degrees also earned more graduate hours and advanced degrees. Despite this apparent conflict, the research regarding joint enrollment has not demonstrated it as a superior form of credit-based transfer programs. The College Board research may also be suspect, since it has been sponsored research.

Swanson (2008) speculated about a positive effect from joint enrollment on degree attainment but did not include a qualitative segment to her research, so this could not be determined. The acculturation derived from exposure to college-level work should not be underestimated. The more familiar students are with the demands of college, the more likely they are to succeed. The potential for success stems not only from the credits and knowledge compiled in the credit-based transfer programs classes but also in the greater confidence they have attained from this exposure. Also, this confidence allows students to spend more time in building networks and the social support systems that make them more comfortable and therefore more likely to find success (Schlossberg, 1989, cited in Dixon Rayle & Chung, 2006). This may help to reduce the cognitive load on students (Paas, Renkler, & Sweller, 2003), effectively gaining the students some intellectual "room" in which to grow.

Anticipatory Socialization

As stated above, simple persistence and degree attainment are not the only or even the best measures for programs such as credit-based transfer programs. One commonly attributed and important benefit of the credit-based transfer programs, specifically joint enrollment, is an increase in anticipatory socialization (Brown Lerner & Brand, 2006). Evidence of this can be found in Bailey, Hughes, and Karp (2002) and Denecker (2007), who reported on studies claiming that joint enrollment students experienced lower GPA drops in their first year of college than non-joint enrollment students.

Kuh (2005 cited in Erickson, Peters, & Strommer, 2006) pointed out that many matriculates underestimate the demands of the first year of college. The hope for credit-based transfer programs students has been that their experiences will act as a buffer, and their time in the “cocoon” of the credit-based transfer programs with higher levels of support in the high school (Calhoun-Dillahunt, et al., 2011; Denecker, 2007; Erickson, Peters, & Strommer;) will translate to a smoother transition. Some studies indicated that all students struggle with the higher expectations typically associated with college (Erickson, Peters, & Strommer). A metaphor that Johns (1993) developed stated that the students are playing checkers while the professors play chess. Sometimes, even the best credit-based transfer program students have mistaken the chessboard of college for the checkerboard of the K-12 system. The credit-based transfer program students may have developed what they believed to be effective working and coping mechanisms in the credit-based transfer program classes. When they entered the college environment on a full time basis and find these mechanisms did not function satisfactorily, they encountered cognitive dissonance. If this cognitive dissonance were not negotiated

carefully and intentionally, it may have led to lower achievement, confusion, and frustration.

Other reports confirmed that the students did not in fact change their learning and study habits to meet these demands but still obtained acceptable grades (Pascarella, Blaich, Martin, & Hanson, 2011). These students adapted old skills to the new environment. Other evidence indicated that credit-based transfer programs did not help the students to obtain better grades at college, and some forms, notably advanced placement, focused so heavily on passing the tests that the students were not exposed to important material and thinking skills that the tests did not or could not cover (Whitley & Paulsen, 2010). The confusion, frustration, and stress from this cognitive disequilibrium could contribute to attrition or to unhealthy behaviors.

Market Expectations for Graduates

Where the workplace in previous decades accommodated graduates or even drop outs with weak skills, the market today demands much higher levels of skills even for entry level positions (Carnevale & Rose, 2011, Karp, et al., 2007). As the Iowa Education Summit in 2011 and the rates of students being placed in remedial classes have made clear, students have not been graduating from high school with the skills needed for these entry level positions. The rapid growth in tuition over the past twenty years has made the development of requisite skills and the exploration of majors an expensive proposition.

Changing majors can greatly extend time to degree attainment, depending on the timing of the decision to change majors. A change in majors could indicate that the student has made progress in transitioning intellectually. Decisions such as this can develop from an increasing level of self-knowledge and the power that students have in

guiding their own development and engaging in self-authorship (Baxter Magolda, 2001; Baxter Magolda, 2007). This fact can help explain why time to degree is not reliable as a sole or even major measure of credit-based transfer program success.

Questionable Motivations

A primary motivator for students to enroll in credit-based transfer programs has been to save students and families' tuition money, since in many states credit-based transfer programs have offered free or low-cost credit (WICHE, 2006). As stated above, some suspicion has existed around the eagerness of community colleges to offer joint enrollment classes, since these have been viewed as cash cows for the colleges (Bailey, Hughes, & Karp, 2002). The accuracy of this viewpoint has depended however, on the policies in the individual states. A survey of state joint enrollment tuition policies in 2005 (Karp, Bailey, Hughes, & Fermin, 2005) revealed that nine states required the students to pay, six required the state to pay, eleven required the receiving institution to pay, six allowed the institution to decide whether or not to charge the students, and seventeen had no published policies. As of 2005, in some states at least, disincentives existed for colleges interested in providing credit-based transfer programs.

As stated above, a student may count in funding formulas several times depending on the funding streams, and this has led to an effort on the part of both colleges and schools to move away from the college milieu to the high school milieu. In Iowa, for example, if a student enrolled in a contracted class, that student would be counted as an additional .125 full time equivalency in the high school and .25 for the community college for the same class. On the other hand, if the joint enrollment class took place on the college campus, the school district was required to pay up to \$250 per joint

enrollment class, resulting in a net outflow of funds for the high school and a loss in tuition dollars and state aid for the community college. Iowa law allowed each student to take up to two joint enrollment classes per semester, regardless of milieu. The fee, in either case, paid by the school was intended to cover both tuition and books. The school could not charge the student a fee unless the student failed the class (Senior Year Plus, 2009), and the college could not charge either the student or the school fees to cover lost revenue.

Social Good of Liberal Arts

Society and the individual benefit from education, but which benefits more? The question of higher education's status as a public or private good (Chickering, 1968; Reindl, 2006) has become an important consideration in the tuition discussions that inevitably have become a part of the credit-based transfer program debate. The locus of the greater benefit indicates who should control or more heavily influence state and federal funding decisions.

Research and public discussion about credit-based transfer programs often centers on the benefits already described, yet ignore or avoid the effects of these programs on learning and the rigorous assessment of that learning. The hollowing out of the American economy in the aftermath of the Great Recession of 2008-2009 has left some questioning the value of a college education (Conner, 2011), as well as its efficacy (Christensen, et al., 2011). Since, as stated above, an important goal of education is to help develop critical thinking in the students, it seems logical that the assessment should focus on various aspects of critical thinking. Conner states that higher education must shift its focus away from vocationalism and back to the discussion about the impact of

improvements in critical thinking, problem solving, and communication (Carnevale, 2011). Part of this process must begin in conversations within and between different levels of education about curricular, programmatic, and course goals, objectives, assessments, and activities (Conner).

Target Populations

Credit-based transfer programs were originally designed for academically advanced students (Brown Lerner & Brand, 2006), but this focus has begun to change (WICHE, 2006) as stakeholders began to realize that credit-based transfer programs have proven beneficial for at-risk and even under-performing students by challenging rather than remediating them (Bailey, Hughes, & Karp, 2002; Hargrove, Godin, & Dodd, 2008; Reindl, 2006; Schneider, 2011). The remediation approach has not proven effective in preparing students for the rigors of advanced high school or beginning college study (Beers, 2009). The challenge approach has been taken to an extreme in many school districts. Hidalgo, a south Texas school district, for example, has made the decision to offer college credit classes to all of its students. Hidalgo, Texas has been home to a student population that did not fit the mold of an academically advanced district, with 90 percent qualifying as economically disadvantaged and 53 percent as limited English proficient (Nodine, 2011). Texas mandated that all students will have access to at least twelve semester hours of credit-based transfer programs credit by high school graduation (Smith, Miller, & Bermeo, 2009).

As the recruiting focus of credit-based transfer programs have changed, so have the requirements for admission to these programs. These requirements can be extremely low in some cases (Iowa Department of Education, 2011), but credit-based transfer

programs can offer these students support (WICHE, 2006) and access to college, especially career and technical education classes (Brown Lerner & Brand, 2006) that they would likely otherwise never have (Bailey, Hughes, & Karp, 2004). With national ACT scores hovering just above the upper limits of cut scores for placement in remedial classes in many colleges (The ACT Test Data, 2011), it seems that some have become ready to gamble on credit-based transfer programs in the hopes that they will prove effective.

Epistemological Development Theories

Epistemology forms our understanding of truth and reality, providing us our conception of the world. These epistemic assumptions control how we interact with society, ourselves, how we approach learning and teaching and how people should act. The theories discussed below established the groundwork for Perry's scheme, or developed the theory in directions not covered in his initial studies. The studies by Belenky, Clinchy, Goldberger, and Tarule (1986) and Baxter Magolda (1992) largely confirm the broad sweeps of Perry's scheme.

Chickering's seven vectors. Chickering (1968) posited seven vectors of identity development that were demonstrated by both college students and people who did not opt to attend college. Exposure to college did make a difference in this identity development. The vectors, as defined by Chickering, were

- developing competence,
- managing emotions,
- moving through autonomy toward interdependence,
- developing mature interpersonal relationships,

- establishing identity,
- developing purpose, and
- developing integrity.

Competence included intellectual, physical, and social skills. Without a sense of competence in these skills, a person could not be completely whole, especially as defined by the liberal arts. Participation in credit-based transfer programs should help develop this competence. The measure was, of course, limited by physical and mental injuries or limitations. More important to Chickering's definition (1968) was the sense of competence, the confidence each person brought to tasks requiring these skills. As Schneider (2011) and Denecker (2007) stated, too much confidence can pose a problem, as well.

As a person moves through the intellectual development positions described by Perry (1970), this confidence may ebb and flow. This ebb and flow can lead to strong emotional reactions, which the second vector described. As the students encounter new ideas and must support their own ideas in the face of informed and logical disagreement, they go through rhythms of differentiation and integration (Chickering, 1968). The development of emotional control and appropriate expression of feelings in cases of challenge and stress (Kloss, 1994) comprised the second vector. Failure to manage this vector can lead to self-doubt and the temporizing, escape, and retreat that Perry described. These failures can lead to a wide range of maladjustment and behaviors among college students, from homesickness and minor disciplinary problems in the residence halls through to decisions to leave college and reaching the extreme in violent behavior directed at the self or others.

Autonomy (Chickering, 1968) and the move toward interdependence seemed to reflect the ability to see and accept the views of others as valid and contextually bound (Perry, 1970). As Chickering stated, this vector and the previous two also continually changes as people encountered new ideas and incorporated them into their being. This incorporation demonstrated the relationship between the third and fourth vectors, and Chickering also acknowledged the close connection of these two vectors and the first two. The fourth vector, the establishment of a "solid" (p. 14) identity, led to change in the later vectors. Of course, this solidity must be relative. As the ebb and flow of the first vectors occur, so too must the identity and autonomy change. Over time, these changes become less distressful or drastic.

The fifth vector, freeing interpersonal relationships, involved accepting and enjoying the diversity among groups and between people. This enjoyment and acceptance become possible only after a person has begun the transitions to the more advanced intellectual development positions defined by Perry (1970) as multiplicity or even relativism. One of the challenges that first-year students face has been the diversity that colleges present to them. Relationships with professors and peers can create feelings of dissonance, which have triggered the growth in the first vectors and a re-establishment of self-identity. These relationships can fuel or obstruct feelings of engagement (Astin, 1993) and the competencies described in the first vector.

Chickering's sixth vector (1968) discussed the need to establish a purpose in life. In college, this has been explicitly expressed in the declaration of majors and defining career paths. As the students move through general education classes and develop the thinking habits and skills that mark a liberally educated person, their interests, desires,

and priorities change. This change may coincide with transitions in intellectual position (Perry 1970), and may contribute to the decision to change majors. These changes help the student progress through the seventh vector, in which the student develops integrity between values and actions. At this point, the student does not need social controls or external guides to work and act with integrity between their values or information and decisions. This student has achieved the upper levels of the Perry (1970) scheme.

Perry. William Perry's scheme of intellectual and ethical development (1970) included nine different intellectual development positions. In his seminal work, Perry used the term "scheme" rather than "theory" to describe his epistemological framework. He also chose to use the term "position" rather than "stage" in his scheme of intellectual and ethical development because position implied no assumptions regarding duration or fixation. A position represented a dominant mode of thinking about knowledge, rather than a well-defined approach to knowledge. The imprecision carried by this term more accurately represented the flexible, fluid nature of epistemology in this scheme.

Perry (1970) divided his nine positions into four forms indicating distinct visions of the nature of knowledge: simple dualism, complex dualism, relativism, and commitment in relativism. The students in Perry's study indicated a progression through the positions, but did not attempt to assign a typical position to an age. By the end of the first year of college, no students were in position one, although some reported thinking in that position when they arrived at Harvard. By the end of the first year, most were in positions ranging from three through five. By graduation, most had progressed to positions six through eight, although a few had achieved position nine.

Positions one and two reflect the simple dualist form. Students in position one, basic dualism (Perry, 1970), had a polar view of knowledge as handed down from “on high” by inerrant experts: all questions could be definitively answered as right or wrong, yes or no. The student made no distinction between what authority figures said or wanted and what was right. When peers questioned the authority, the student appeared to begin the shift toward position two. This shift could find two expressions, with the critical difference being the splitting of authority away from absolute knowledge. This split occurred when the student realized that even the authorities had sources from which they drew knowledge. At all times, the student attempted to conserve as much of the existing epistemology as possible. This conservatism occurred in every position of this scheme (Perry).

Students in position two, multiplicity prelegitimate (Perry, 1970), ventured toward multiplicity, recognizing that different people advanced and believed different answers were right, but still holding that clear distinctions occurred between right and wrong exist (Perry). In position two, the student’s perception of the source of rightness, in terms of correctness and of morality, could differ dramatically. In one expression, absolute truth and authority adhered, and the student allies with them. In another, authority was in opposition to absolute truth, and the student rebelled against authority. In the final expression, multiplicity was regarded as alien (Perry) and artificial, an exercise to develop vague thinking skills and well-roundedness. An important difference between position one and two was that the student recognized that the authorities may not have all the answers as yet, for some reason.

Positions three and four reflected the complex dualist form, a critical time of transition. Perry called multiplicity “simple pluralism” (1970, p. 57). Students positioned in complex dualism were developing an understanding that multiple points of view existed and were coming to believe that these can be equally valid. Position three, multiplicity subordinate, (Perry) represented the departure from simple dualism, in which all truth was knowable. The student still believed that truth existed, but began to accept that some truths may be unobtainable, even by authorities. This fundamental uncertainty can cause students to believe that few, if any, valid external standards existed for judgments: All views become equal and legitimate, if expressed well. This position took two expressions: adherence to authority, in which the truth is currently unknown, but knowable; or opposition to authority, in which the student resorts to naysaying in areas of uncertainty. The student in position three is surrounded by cognitive chaos.

Position four, multiplicity correlate or relativism subordinate (Perry, 1970), still accepted absolute answers in some areas, but in areas of uncertainty, accepted the existence of multiple valid answers. In this position, all views in areas of uncertainty were regarded as equal, regardless of expression and of external standards (Perry). This position approaches solipsism. As in earlier positions, Perry found two forms of expression. Multiplicity correlate resulted in opposition to authority, while relativism subordinate resulted in adherence to authority.

Multiplicity correlate students demanded that the authorities justify their views and in so doing, were hoist[ed] by their own petard: Their demand for evidence or reasons forced them to offer external evidence as well, pushing them toward relativism (Perry, 1970). Relativism subordinate students attempted to think as the instructors

wanted them to, to think as physicists or as writers, and so began to recognize the inherent complexity of the subject matter. While students in position four began to separate themselves from their dualistic epistemological assumptions, they had not yet tried to apply this manner of thinking to other areas, and so had not approached position five, which marked the true and reflective acceptance of multiple points of view as valid.

Positions five and six reflected the relativistic form and a genuine change in epistemology. Students positioned in contextual relativism understood that different contexts could indicate whether a course of action or a decision was “right” or “wrong”, regardless of the position of authority figures. Where a variety of dualism had controlled their thinking, the students in position five, relativism correlate (Perry, 1970), now saw context as dictating right and wrong. These students reserved dualist answers for a very limited and special range of simple questions. Perry found students did not mention this critical position as world-changing, perhaps because the relativistic approach gradually became more habitual for them as they found it useful in more situations. These students appeared to have undergone a significant identity change in the shift to position five. Perry found three forms in position five: relativism correlate, competing, and diffuse. The students began in relativism correlate or competing, and ended in relativism diffuse. Diffusion indicated a widespread application of relativism, but without the realization that this relativism had personal and social consequences.

Perry (1970) stated that students in position six, commitment foreseen, faced a choice between either an existential crisis with two outcomes or to commitment to a set of values and an identity. In successfully negotiating this position, students began to recognize their responsibility and power to make choices with integrity to their identity.

The students began to see their roles in the authority that had defined truth, although with the realization that this truth was not absolute. The decisions in commitment facing students in this position took the students through Chickering's (1968) vectors once again.

Students in the fourth form, commitment in relativism, typically ranged from positions seven through nine: initial commitment, orientations in implications of commitment, and developing commitments. These students were able to make firm, ethical commitments to a way of working, thinking, and living. Perry (1970) did not see these more complex positions as major changes in the student's epistemology, but rather as an increasingly qualitatively deeper understanding and acceptance of the commitments the student chose to make. Position seven focused on choices, including many professional, vocational, social, and familial options.

Progress through these positions is not smooth and continuous (Baxter Magolda, 1998) but rather moves in surges (Perry, 1970) or spurts (King & Kitchener, 1994) and requires considerable psychic and emotional energy. These points can be gradual or as abrupt as the proverbial "light bulb" or a tectonic shift that rocks the student's world view. In either case, the student's world view has radically changed, and this change carries with it consequences for the student's epistemology.

Transitions in the positions may not always be progressive, positive, or permanent (Perry, 1970). It is possible for students to take more advanced positions than they would normally hold, if given the right circumstances. For this reason, Perry refused to use the term "stage" for his theory, since stage implied only progress through a series of steps. Just as external pressure can encourage students to shift to more complex positions,

students may regress or make negative transitions in response to stressors in the environment. Emotions, family, friends, culture, and surroundings can all significantly impact these stress levels. Perry termed these transitions “Temporizing, Escape, and Retreat” [sic] (p. 57-58). These reactions to stressors can be academic, social, financial, or personal. Inadequate academic preparation, excessively challenging academic tasks, social maladjustments, and inadequate coping skills can trigger these feelings of stress and a regressive response. Credit-based transfer programs are claimed to help mitigate or even eliminate these stressors (Swanson, 2008).

Critiques of Perry’s Scheme of Intellectual and Ethical Development. Several mainstream critiques of Perry (1970) have been advanced, largely based on the fact that Perry’s original sample was composed of male Harvard students in the 1950s. Concerns were raised based on factors of race, gender, socio-economic class, and an ever-changing society. Perry himself raised these issues in his final chapter. Belenky, et al. (1986) and Baxter-Magolda (1992) presented theories that more closely examined the development of women in college, using different terms and parsing the development slightly differently. However, all the theories appeared to move students through approaches to knowledge that closely mirrored Perry’s original scheme (Pintrich & Hofer, 1997; Moore, 2002). All appeared to confirm constructivism as the accurate model of learning.

Other concerns raised included the misreading that the progression through the stages was universal and inevitable. Perry’s (1970) scheme was descriptive, not prescriptive: a student could resist learning and cling to familiar approaches to new learning. Perry termed this behavior escape. Perry was very clear that he was describing students in a particular context, and allowed that the scheme might not apply in other

contexts. That his scheme has been found to be useful outside that context (Baxter-Magolda 1992; Belenky, et al., 1986; Kurfiss, 1988) is a testimony to the scheme's robustness. At the same time, most of the research has taken place in the United States, and other cultures may identify additional areas of caution or concern, or even different end points (Pintrich & Hofer, 1997).

The Pygmalion Effect can also give rise to concerns. This effect stated that performance is dictated or heavily influenced by instructor expectations. The concern here was that if a student were identified as exhibiting more features of position two, the instructor may not push the student adequately to lead her to shift to the next position, effectively handicapping her intellectual development (King & Kitchener, 1994). Perry (1970) indicated that the positions were fluid and contextual. An identification in a position could not be taken as definitive or permanent, as discussed above.

Belenky. Belenky et al (1986) began their study in reaction to Perry's 1970 study, which met with criticism that the sample was homogenous and located in an institution designed to socialize students into a particular elite system. Belenky et al did use Perry to frame their study, but excluded men from their study, reasoning that since the larger social and academic discussion is dominated by men, this exclusion would not harm their findings. The sample was drawn from colleges and family service clients, from six colleges and three social agencies. Perry did compare the data from the few women in his study to the findings of the men, but Belenky et al were concerned that Perry's study could not detect the themes that might better describe the females' development.

An epistemological assumption that influenced the direction of Belenky et al's 1986 study was that gender plays a role in concepts of authority and competency, and a

role in defining acceptable lines of work or investigation. A common stereotype stated women's thinking was emotional, intuitive, and personalized, which runs contrary to the analytical philosophy and logic that have been most valued in the Western academy, where the focus has been on "autonomy, independence, abstract critical thought and the unfolding of a morality of rights and justice in both men and women" (Belenky et al, p. 6). They pointed out that the academy ignored these differences in study, teaching, and assessment, assuming that what worked for men will work for women.

Research on intellectual development since women entered the academy has focused on minimizing gender differences in the areas that were valued by the traditional masculine academy, which Belenky et al (1986) termed "separate knowing", and has not focused on the "interdependence, intimacy, nurturance and contextual thought" (p.7), which they termed "connected learning", that characterized women's thought (Belenky et al). They wanted to examine the ways of thinking and intellectual development that tended to find greater development in women. They did not claim the ways of knowing they described were pure and complete, but rather acknowledged that they were fluid and inadequate to capture the complexity of human thought and life. Belenky et al also wanted to discover why so many women in their sample identified gaps in learning and a lack of confidence in their intellectual and communicative abilities. They drew their sample from educational institutions and also social agencies, assuming that the social agencies would honor more of the women's ways of knowing, since they focus on women and are largely staffed by women.

In their theory, Belenky et al (1986) referred to "epistemological perspectives" (p. 14) and did not posit stages or positions. They speculated about possible trajectories,

although the motivators of these trajectories were not explored. Belenky et al noted that traditional epistemology used vision, not speech, to describe knowledge and epistemology. The intentional blinding of researchers in traditional research methods to objectify the data prevents the researcher from “acknowledging the role the knower plays in the construction of knowledge” (p.19). Vision, which consumes information, requires a measure of physical and temporal distance to comprehend what is seen, while speaking and listening, which construct knowledge, require proximity and immediacy. This metaphor-driven bias was revealed in the language used by their study’s participants, who repeatedly used images of silence and inability or lack of facility in communicating their thoughts to themselves and to others. Belenky et al used a phenomenological approach similar to Perry (1970) to describe five ways of knowing: silence, received knowledge, subjective knowledge, procedural knowledge, and constructed knowledge.

These knowledge perspectives required the women to work through new problems of identity relationships with others, including internal and external authority to find their voices. In silence, the women believed they had no self or voice. In subjective knowledge, the quest for and protection of the self was most important. In subjective knowledge and procedural knowledge, the women felt no authentic self, and had little sense of centeredness. Constructed knowledge attempted to reconcile these varied and fractured selves into a coherent whole, to balance the internal and external sources of knowledge.

Silence. The first perspective that Belenky et al (1986) defined was silence, a perspective of mindlessness, voicelessness, and powerlessness. The silent person depended completely on external authority for truth, and could not comprehend the

possibility that authorities might have legitimate differences in matters of apparent fact. Representational thought is difficult to formulate, and therefore the silent person did not connect ideas and action and appeared unable to engage in internal dialogue. Play using toys for other than the intended purposes allows children to begin taking hypothetical stances. This may be an important step toward the shifts characteristic of intellectual development (Belenky et al, 1986).

The home and social environments of the women in or recently departed from silence indicated a lack of acceptance of representational thought. Because of this, Belenky, et al (1986) found that few women actually fell into the silence perspectives. Similarly, Perry (1970) found position one difficult to observe or detect, and both researchers found that students in this position were unable to articulate their epistemologies. However, some subjects in Belenky et al's study were able to clearly remember and relate the feelings, if not the thoughts, that indicated a relatively late shift from silence into a more advanced perspective.

Received knowledge. Received knowledge was defined as a perspective allowing the capability to receive knowledge and reproduce it, but not to create it (Belenky et al, 1986). Becoming a mother defined a tectonic shift for many of the women, as they moved from silence to received knowledge. Belenky et al. referred to received knowledge as a species of dualism, albeit a more advanced form than silence. Women in received knowledge found truth in authority, and classmates or peer group members allowed them to have their voices in their lives.

Women in received knowledge were intolerant of ambiguity, literal, and liked predictability. If they did not understand an idea immediately, they did not "get" it at all,

failing to see understanding as needing time and effort. Knowledge was not to be transformed, but was to be filed and used on demand. The women in received knowledge were drawn from the social agencies and in the first years of college. Those participants who did not succeed in shifting from this perspective were likely to drop out of college. Women in received knowledge did not identify with authority figures in the development and transmission of knowledge. Belenky et al posited that authority figures can either stunt or help develop these women's voices. In discussions of morality, women in this perspective chose to benefit others over themselves.

Subjective knowledge. Subjective knowledge was defined as a perspective that holds truth and knowledge as "personal, private and subjectively known or intuited" (Belenky et al, 1986, p. 52). Women in subjective knowledge used inward listening and observation as opposed to external, especially formal, sources and methods. A chief criterion of truth for them seemed to be pragmatism. This inward listening appeared to form a prerequisite for reflective and critical thought, which was notably absent from the women in silence. They saw themselves as a conduit for truth, rather than themselves as constructors of truth. They formulated analytical and learning processes for themselves. This perspective is still dualistic, but the locus of control has shifted from external to internal sources. Belenky, et al claimed that subjective knowledge was similar to Perry's early multiplicity in the emphasis on personal truth. Perry marked the shift into multiplicity at early adolescence, linking growth to pluralism and a liberal education. However, in Belenky et al's study, the shift to subjectivism was not initiated by academic experiences, but by life experiences. Often the shift was vividly remembered and pinpointed to a precise moment.

Subjective knowledge was a major milestone for women, and Belenky et al's group (1986) did not make this shift until much later, sometimes as late as age 40 or 50. This group made up about half of the total sample, and according to the researchers, most came from disadvantaged, permissive, and chaotic homes. Many were still unable to speak of their silence periods. Many of the women in this perspective had broken with their families and had withdrawn from other obligations to focus on developing themselves. These women frequently needed to redefine their self-identity, and had to work through Chickering's vectors (1968) as they re-established their external and internal support networks. Some in this perspective were aggressively subjectivist, similar to Perry's oppositional multiplists. These women isolated themselves and shut down, denigrated, or insulted opposing viewpoints. Relatively few women took this line of defense, opting to hide their true positions because middle class socialization did not reward women as it did men for risk taking. Therefore, subjective knowledge women appeared to "fit in" and listen, but internally rejected the views of others while not trying to disabuse them of these views (Belenky et al). This may reflect a species of Perry's (1970) temporizing, escape, and retreat.

Procedural knowledge.

The voice of reason. Procedural knowledge was defined as a perspective in which women engage with learning and objectively obtain and communicate knowledge (Belenky et al, 1986). As the women in procedural knowledge went through the received and subjective knowledge perspectives, they did not lose trust in authority, eventually realizing the authorities did in fact support them in their efforts to grow and express themselves. The women in procedural knowledge realized that intuition was fallible and

that truth could be shared, analyzed, and verified. For some of the participants, the thinking process became more important than the resulting decisions and actions, and the process appeared to control and to impede the insights available to unconventional thinkers. The initial entry to procedural knowledge did not feel successful to the women, as they struggled to solidify the shift. This observation fit with Chickering's (1968) vectors, where developing competence was the first step in a recursive process of growth.

This perspective's focus on process increased the feelings of isolation, but as procedural knowledge became integrated, the women discovered how to think and communicate. An important difference between this perspective and subjective knowing was that the procedural knowledge women were actually open to different ideas, while subjective knowledge woman only claimed to be. The women in procedural knowledge learned to be attentive to the external world and then to accept this reality.

Separate and connected knowing. In their discussion of procedural knowledge, they divided procedural knowledge into separate and connected knowing. Belenky, et al (1986) posited these as "contrasting epistemological orientations" (p. 102). Throughout their theory, Belenky, et al distinguished between understanding and knowledge: Understanding was "personal acquaintance with an object... intimacy and equality between self and object," while knowledge "implies separation from the object and mastery over it" (p.101). Belenky, et al equated critical thinking, and their two classes of knowers within procedural knowledge, with Elbow's (1973) believing and doubting game. Separate knowing privileged an instrumental, impersonal approach to learning, while connected knowing focused on caring relationships between the student and the object of knowledge. Caring for a subject brought with it the feeling of understanding and

the assimilation of the subject in the world view. Connected knowers were more common in the women from less-selective institutions or the social services agencies, although it was also found to some degree in all the women. These two epistemological orientations may be gender-related, although not gender-controlled.

In separate knowing, the doubting game required all propositions to be skeptically tested before acceptance. Analytical skills were a defense against the words and ideas of others, but most in this perspective would not jeopardize relationships to do this. This desire to preserve relationships led to dutiful thinking, which failed to connect to the students' actual thoughts and beliefs. This disconnect may have led to maladaptation in terms of Chickering's (1968) vectors. The students spoke in, and identified with, a persona that did not match their internal reality. It could have masked that reality from themselves, even, and resulted in Perry's (1970) temporizing or retreat. Belenky, et al called the doubting game the opposite of subjectivism: "every one-including themselves-may be wrong" (p. 104).

In connected knowing, students used the believing game (Elbow, 1973) to figure out how to access the knowledge that others can bring to them. They tried to feel the experience that led the person to this knowledge. The women in the study generally found this approach to be easier than the adversarial doubting game. Separate knowing used the lens of a discipline, while connected knowing used other people as the lens. The latter first focused on the facts of the person's life, then on the persons' ways of thinking. The procedural nature of connected knowers was real, but less well-explored and -developed than that of separate knowing. They saw personalities as enriching the conversation, whereas separate knowers saw personality as noise to be filtered out.

Connected knowing used the self as an instrument of investigation. This was a technique used in qualitative research, too (Hatch, 2002).

The focus in connected knowing was on the questions of others, rather than students' own questions, on which separate knowing focused. Connected knowers cared more deeply about the object of knowing, and therefore were better positioned to pose their own questions, according to Belenky et al's speculation. However, few highly reflective women relied on connected knowing.

Constructed knowledge: Integrating the voices. Constructed knowledge was defined as a perspective in which all knowledge is contextual, in which women value both objectivity and subjectivity as they construct knowledge (Belenky et al, 1986). This perspective was similar to Perry's (1970) positions 6-9. The basis of this perspective states "All knowledge is constructed, and the knower is an intimate part of the known" (p. 137). As in Perry's commitment in relativism, a woman in constructed knowledge will see that context will govern the best answer and will therefore tolerate ambiguity well.

Approaches to thinking and living in this perspective became more intentional, and a narrative of their own life emerged (Belenky et al, 1986). Only in constructed knowledge did Belenky, et al see an "opening of the mind and the heart to embrace the world" (p.141). This led to a self-awareness that aided the women in their developing procedures for approaching the world and themselves. Posing their own questions and problems governed the development of investigations, although women in constructed knowledge were not cowed and controlled by systems, such as the scientific method. These women had moved beyond these disciplinary systems as they developed, but they

used the systems to answer their own questions. Theories became models for experience, "not fact but educated guesswork"(Belenky et al, p. 138).

Baxter Magolda self-authorship. While Baxter Magolda (1988) stated that as students develop intellectually, they effectively become new people, Perry (1970) stated that most of his subjects were able to avoid "a crisis of selfhood" (p. 77). It is possible this crisis may not be triggered until after the students can recognize that the accuracy of knowledge can be contextually defined (Baxter Magolda, 2001), a stage of development that typically is reached after the completion of undergraduate studies.

Most research on intellectual development has not spoken to the effectiveness of high school programming on intellectual development (Perry, 1970; Baxter Magolda, 1988). Existing research has indicated that the bulk of intellectual development occurs in the first two years of college (Baxter Magolda, 1988). If this admittedly dated information is accurate, the findings by Arum and Roksa (2011) and Pascarella, Blaich, Martin, and Hanson (2011) are even more concerning, since these more recent studies found that less than half of the students developed critical thinking skills in the first two years of college.

Although Kurfiss (1988) predated Arum and Roksa (2011), her comments may help to explain the failure to progress described these studies. Kurfiss posited that most faculty avoid discussions of morality in classes, preferring to rely on the content of the discipline. However, the intersection of content knowledge and moral or ethics is exactly where the development aiming toward relativity and higher Perry positions will most likely happen.

This reluctance to engage in the moral dimensions of disciplines has helped to isolate the academy from society, leading to problems in learning, development, and external political support. Presaging Arum and Roksa's (2011) findings, Belenky, et al (1986) claimed that students were unable, in the main, to justify judgments based on evidence, even after graduating from college. They may have been able to reason in their majors, but when asked about other disciplines or everyday issues, they could not or did not transfer the reasoning or critical thinking skills. This problem was also a focus of Allan Bloom's *Closing of the American Mind* (1987).

Courses that isolated on critical thinking in the tradition of analytical philosophy and logic (Brookfield 2012) failed to work (Arum and Roksa 2011) because students only learned to use their old ways of thinking using more advanced tools. These approaches allowed them to become more entrenched in their habits of thought. This is Perry's Escape. In cases where students do not escape, they can temporize longer by arguing that every side is valid, a belief common to students in position three (Perry 1970).

Researchers in intellectual development have agreed that the majority of matriculating students are located in dualism (Perry, 1970), absolute knowing (Baxter Magolda, 2001) or an analogous stage. Only after a period of exposure to epistemological challenges do the students make a transition. These challenges came from a curriculum and co-curriculum that asked the students to take an active voice and role in the conduct of their classes and activities (Clinchy, Lief, & Young, 1977). Clinchy, Lief, and Young found that the students with these experiences were considerably advanced over their peers in more-traditional educational settings. King, et al (1983) indicated students change at most one stage in two years. Perry did not propose a distribution for these

positions, but Table 1 indicates the distribution that Baxter Magolda (2001) found in her studies.

Table 1

Distribution of Stages of Knowing as Percentages

	Absolute knowing	Transitional knowing	Independent knowing	Contextual knowing
First year	68	32	0	0
Second year	46	53	1	0
Third year	11	83	3	1
Fourth year	2	80	16	2

Baxter Magolda (1988) discovered the possibility that during discussions and interviews, some students attempted to conceal intellectual development transitions in conversation with peers, but she did not elaborate on the possible motives for this. It is possible that this concealment arose through efforts to attain or maintain membership in a peer group (Baxter Magolda, 2001). The first year of college is a tumultuous time, and as students dealt with their own growth and perceived or speculated on how these changes would be accepted or rejected by former high school peers, friends, and family, they may have experienced significant levels of stress as they negotiated Chickering's first vector (1968) and reestablished or revised their intellectual and social competencies.

This stress caused by this redefinition or revision was defined as mourning by Kloss (1994). Baxter Magolda (2001) stated that this mourning of the self could be normal as signs of progress through the intellectual positions become clear to the

students. The student had the option of rejecting or concealing that progress in favor of maintaining a preferred self-identity. Indeed, Baxter Magolda indicated that self-authorship required a sense of self-identity (Chickering, 1968) that could not begin to happen until the student began to rely on the contextual basis of knowledge, which depended on the student reaching the fifth position in Perry's scheme (1970).

Nothing in the literature to date has investigated the possible benefits of constructed response inventories such as the LEP (Moore 1989) in instances of transition concealment. With anonymous surveys rather than interviews, it is possible that the students will provide more accurate reflections of their actual intellectual development position.

Perry (1970) stated that educators can best help students through the positions of intellectual development by helping them take a role in the community of scholars that typifies the best academic environments. Even as education provides challenges to thinking and furnishes challenging ideas, the students do not perforce engage with the ideas: they do not always care about the intellectual challenge but rather focus on the grade or the credential. According to Perry, the challenge posed to the educator is to find ways to help the students take the risks associated with caring about the ideas. This caring about ideas can begin the great re-identification of the self that leads to successful transitions to the college environment and to the intellectual growth that is the goal of higher education.

Baxter Magolda (1994) defined four ways of knowing: absolute, transitional, independent, and contextual. She changed the labels for her model to free her thinking from preconceptions based on previous research, and because the labels from Perry

(1970) did not capture her participants' discussions. She recognized that the variety of experiences prevented categorization of students' epistemologies and stated that educators needed to listen to the students to know how to address them. Baxter Magolda's study population faced sampling issues, as it was composed of 101 participants from the a single public university, 75 of whom were from Ohio and only 3 of whom were from non-dominant populations. Perry's scheme (1970) with its focus on male students missed some aspects of intellectual development (Baxter Magolda, 1994), but Baxter Magolda's repeated some of the same issues.

Absolute knowers saw the teacher as the source of knowledge and the student with the role to absorb and regurgitate information (Baxter Magolda, 1992). Knowledge was certain, and conflict resulted from degrees of detail, different opinions of facts, or misinformed authorities. Teachers had the responsibility to transfer knowledge, and since peers do not know the material, they could not help. Baxter Magolda identified two gender-related patterns in this stage: received and mastery. Women used a receiving pattern, while men used a mastery pattern. Receiving students recorded and listened, used peers as support, did not ask questions of authority, and resolved discrepancies by themselves. Mastery students engaged verbally in class with peers and teachers, and appealed to authority to resolve discrepancies.

Transitional knowers saw knowledge as equivocal and needing justification (Baxter Magolda, 1992). The teacher still controlled and transmitted knowledge, which the student had to understand and use. Peer interaction became more important in this perspective, and absolute knowledge was thought to still exist in some areas of knowledge. Baxter Magolda identified two gender-related patterns in this stage:

interpersonal and impersonal. Women relied on interpersonal patterns, listening to peers to correct errors and to hear new perspectives. They still resolved uncertainty through personal judgment, but began to seek rapport with faculty. Men relied on impersonal patterns, preferring debate to hone ideas. Men used logic and research to resolve uncertainty, and faculty were expected to pose intellectual challenges.

Independent knowers saw knowledge as uncertain, and differences in authorities revealed that uncertainty (Baxter Magolda, 1992). The students began to become sources of information. Teachers provided a context for exploration of knowledge. For the student, judging other people's positions was difficult, if not impossible, and even unneeded. Baxter Magolda identified two gender-related patterns in this stage: inter-individual and impersonal. Women used inter-individual patterns in which thinking for self and engaging with the thinking of others was valued. Men used individual patterns that valued peer and instructor idea exchanges in order to focus their own thinking. Challenge extended the thinking of people who preferred this pattern.

Contextual knowing did not often occur in undergraduates (Baxter Magolda, 1992). Knowledge remained uncertain, but justifications and judgments could be based on evidence and defended. However, they could not become final, since the contexts or evidence could change. The drive was to synthesize information and data to construct a solid position. Teachers provided environments for application of knowledge and evaluation.

A year after graduation, only 12% of participants had reached contextual knowing, preventing gender generalizations. Secondary patterns became more prominent in contextual knowing students, perhaps indicating a growing comfort in the different

stages. King and Kitchener (1994) indicated that the time between stages allowed for reinforcement and growth, despite the lack of a shift during this plateau.

King and Kitchener. King and Kitchener (1994) reported on a series of studies based on their Reflective Judgment Interview. Males appeared to test higher than women on the Reflective Judgment Interview in studies where a gender effect occurred. Only half of the studies reporting on gender found a difference. King and Kitchener explicitly adopted the term “stage” and claimed the model fit the high school audience, as well. King and Kitchener asserted that people do not rely only on one stage at a time as they think and justify beliefs. This statement allowed for the fluidity of thinking that Perry (1970) aimed for in choosing his term “position” over King and Kitchener's “stage”. This fluidity accounted for regression under stress or in particular areas of life, such as religion or political views. The stages progressed in complexity, precision, and abstraction, and the interrelationships became more complex.

Critical thinking and reflective judgment share some characteristics but have distinct aspects, as well. Most critical thinking theories have failed to consider epistemic assumptions and the structure of problems, approaching thinking as a species of problem-solving or variations of the scientific method (King & Kitchener, 1994), as Elder and Paul (2010) advocated. According to King and Kitchener, the structure of problems divided questions into puzzles or problems. They defined puzzles as well-structured problems or questions. Puzzles can be resolved by syllogisms and formulae, once assumptions are described. For example, $5+5=10$ in a base 10 number system, but 13 in a base 7 system. A reflective thinker asked about the assumptions that defined the question

prior to proposing a solution. They were interested in how people attacked ill-structured problems, which they termed real problems (King & Kitchener).

Reflective thinking can only happen after a real problem has been defined. A real problem could not be resolved with definitive solutions because of missing, unclear, or contradictory data or assumptions. King and Kitchener (1994) contended that before people could evaluate competing assumptions, they must understand that such competition among assumptions can exist, and that these assumptions could be simultaneously valid yet partially inaccurate. Problem solving strategies could not resolve this: an epistemological perspective is needed. King and Kitchener claimed that *epistemic cognition* was needed: "the process an individual invokes to monitor the epistemic nature of problems and the truth value of alternative solutions" (Kitchener, 1983, p. 225).

Reflective thinkers and critical thinkers approached the origin of knowledge differently. Problem solving critical thinkers argued from authority, which is an authoritarian approach. Reflective thinkers argued from an authoritative approach, in which solutions were provisional and subject to the discovery of new information.

Reflective judgments began with awareness of uncertainty, leading to the examination of data and relation of the data to theory. This examination resulted in solutions that could be defended. Reflective judgment focused on thinking about ill-structured problems in a developmental process. Only reflection could help to identify gaps in data, inadequacies, and the courses of action predicated on these. Other criteria to include were "coherence of argument" (p. 7) consistency of data, and "plausibility" (p. 7). This required constant evaluation of assumptions (Brookfield, 2012), hypotheses, and conclusions. Reflection should yield better conclusions because of this constant process.

The Reflective Judgment Model. King and Kitchener (1994) found that epistemology and justification were consistent within a given stage, leading them to assert a model supporting an interrelationship between assumptions and approaches to justification about beliefs. Correlations between responses to different questions on the Reflective Judgment Interview were moderate to high and did not appear to vary according to content knowledge. King and Kitchener concluded this indicated the existence of stages of epistemology. These stages were stable and invariant in sequence, but not in pace. The model had seven stages with their own logical coherence, sequentially increasing in inclusivity and the integration of assumptions on which to base perspectives and solutions. Each stage used different strategies for ill-structured problems, allowing for better data and more fine-grained resolution of classes of problems. “Better” in this context meant complex and complete. “Resolution” referred to distinguishability.

Reflective judgment resulted from a person’s conceptual skills and environment working together to help the person think critically and to solve problems (King and Kitchener, 1994). Most events in a person’s life did not cause a person to stretch their skills enough to require a shift in epistemological stage. The persons’ skills and assumptions controlled their growth through these stages, and this growth, while gradual, was punctuated by growth spurts, followed by apparently quiescent periods. More abrupt spurts could happen if students were kept operating in their zones of proximal development (Chaiklin, 2003). During the apparently quiescent periods, the students rehearsed, reinforced, and strengthened their epistemological changes and changes in

approach to justification for their stage (King, Kitchener, Davison, Parker, & Wood, 1983) . These may be equivalent to Perry's temporizing periods.

King and Kitchener's (1994) model was divided into three categories and seven stages: pre-reflective, quasi-reflective, and reflective. The first group, pre-reflectives, includes stages 1-3. Pre-reflectives assumed knowledge was absolute and discernible by direct observation. In cases where observation was personally impossible, pre-reflectives assumed that experts had the knowledge. People in this stage could not consider classifying problems differently. In Perry's (1970) scheme, these students are dualists. The second group, quasi-reflectives, fell into stages 4-5 (King & Kitchener, 1994). Quasi-reflectives understood that uncertainty existed, and while evidence should be used, ultimately everything was an opinion. Resolving ill-structured problems proved a challenge, because interrogating the assumptions was beyond them. In Perry's (1970) scheme, these students are dualists or early multiplists. Stages 6 and 7 made up the final group in King and Kitchener's model, reflectives. Reflectives realized that knowledge was constructed and contextual, and that some opinions or positions were invalid or implausible.

Pre-reflectives. For stage one students, seeing is believing (King & Kitchener, 1994). Knowledge and belief were identical, and people in this stage tended to ignore contradictory data. When presented with ill-structured problems, Stage 1 thinkers did not know how to react. The acknowledgment of contradictions laid the groundwork for the shift to stage 2. These students were primarily academically weak high school freshmen. In the view of students in this purely dualist stage, the justification of knowledge was pointless.

In stage 2, students believed that truth existed, but not everyone possessed this truth (King & Kitchener, 1994). Authority figures had this truth and could distribute it. They understood that alternative, but ultimately incorrect, versions of the truth existed. The realm of belief bifurcated into right beliefs and wrong beliefs. This stage required the ability to relate concepts to each other, allowing for rudimentary understanding of ill-structured problem. The students assumed a single right answer for all questions, and the students' own ideas were assumed to be right. When asked to provide justification, the student depended on authority figures or accordance with beliefs and would frequently skew evidence to support preconceptions.

By stage 3, student believed that not even authorities had all the truth, but they had faith that it would be found (King and Kitchener, 1994). The student clung to the belief that absolute truth still existed. Especially in areas where truth was not yet known, justification was not possible, since all positions could be reduced to mere opinion, as Perry's multiplists claimed (1970). Where possible, faith in truth transferred to evidence, rather than to opinionated authorities. The melding of belief and evidence made addressing ill-structured problems a confusing proposition. Being asked for justification based on evidence helped to move students toward Stage 4.

Quasi-reflectives. King and Kitchner (1994) found that graduating seniors had reached the lowest ranges of quasi-reflective thinking. By stage 4, students had come to realize that truth could not be known with certainty, and this was true across disciplines (King & Kitchener). Selecting evidence to fit preconceptions was a common choice. Because these students assumed all people operated this way, authority remained questionable. Evidence and belief were still conflated, so contradictory evidence could be

ignored. The idea that evidence should lead to conclusions was not considered. Critical to this stage was the recognition of knowledge and justification as abstractions, as was recognition of the need to provide justifications, which became an integral part of argument. However, since the connection between justification and knowledge was weak, knowing was still individualistic. At this stage, students began to take the first step towards a public standard.

In stage 5, knowledge was context-bound and inherently uncertain (King & Kitchener, 1994). This stage began to be able to connect two abstractions in order to compare and contrast them. Differentiating between the elements of an idea and its interpretation began at this stage, but was limited to working within the context of a given field. This reduced the student's ability to handle ill-structured problems with facility, although evidence typically was not bent to fit their own preconceptions. Relativism began to appear in the thinking of the students as they realized that alternatives existed.

Perry (1970) did not explore epistemological shifts beyond relativism, but King and Kitchener (1994) saw evidence of stages beyond relativism in their graduate students. This area beyond relativism appeared to be a synthesis of various positions or perspectives, allowing for more progress toward more defensible perspectives. King and Kitchener differentiated from earlier models (Baxter Magolda, 1983; Belenky et al, 1986; Perry, 1970) by stating the primacy of epistemological perspective over the inductive and deductive reasoning valued by most critical thinking scholars.

Reflectives. In stage 6, students recognized that knowledge was not static, but must be constructed, even by experts, as new perspectives and nuances came to light (King & Kitchener, 1994). This stage realized that resolutions and decisions must be

delayed while perspectives were considered and synthesized. This required that context and evidence be considered, as must plausibility and utility of solutions. Common elements from multiple ill-structured problems began to become clear, allowing for judgments to be drawn and for new systems to be developed. The quality, rather than correctness, of a solution, was sought above all. These students again relied on authorities, having recognized why the authorities are in fact authorities. However, this was not the blind belief of earlier stages, but the clear vision of thought. Justification arose from the comparison of evidence, perspectives, and relevant criteria, but final choices were still individualistic and limited because the student still failed to comprehend the larger systems.

In the final stage 7, evidence and opinion must be interpreted and synthesized into justifiable positions about the nature of ill-structured problems and about knowledge (King & Kitchener, 1994). Using critical inquiry, students could select judgments based on their truth values. Time, experience, and new data required the reassessment of truth and the value of judgments. These students could unite principles from several systems, allowing for more generalizable justifications and construction of knowledge through critical inquiry. The ability to critique their own positions and to prefer reason over their own opinions marked the thinking and working of this stage. King and Kitchener stated that this stage's willingness to re-evaluate decisions based on new information or interpretations differentiated this model from Perry's (1970) commitment in relativism. However, Perry did not mean his positions 7-9 to be fossilized, fixed allegiances to a given point of view. This was where the ethical development part of the model stepped

in. Perry's thinkers, in selecting a perspective, also had the responsibility to develop the ethical ability to question and critique their perspectives.

Paul and Elder. Elder and Paul (2010) posited predictable stages in intellectual development rather than positions (Perry, 1970), although they recognized that development can be recursive and uneven. That is, people can practice advanced thinking in one area of their lives, while an earlier stage can govern in other areas. Elder and Paul agreed with Perry that regression can occur, although they stated that regression was a matter of indolence and would not occur if the student made a sufficient commitment to critical thinking. This appeared to reject Perry's notion that a person may consciously choose a regressive position or stage for emotional or psycho-social reasons. The six stages in Elder and Paul's theory described thinkers as follows: unreflective, challenged, beginning, practicing, advanced, and accomplished.

Description of the Paul and Elder stages. Unreflective thinkers in stage one (Elder & Paul, 2010) had some skills in thinking, but were unaware of them, or how they worked to advance or impede their knowledge. Elder and Paul contended that students graduate from secondary levels and even college at this level, and their teachers and professors underestimated even this relatively low level of thinking, further limiting their academic preparation and skills.

Challenged thinkers in stage two (Elder & Paul, 2010) have become aware of their thinking as a process and recognize that it can cause them problems. These students have entered Schlossberg's transition stage of "approaching change" (Schlossberg, 1981). While aware of these problems, the students did not know how to correct them, and attempted to use the skills they had, which "may (ironically) serve as barriers to

development” (Elder & Paul). This stage was analogous to Perry’ positions two and three, in which students admitted that multiple approaches existed and were used, but the students still believed that a single “right” answer existed for every problem.

Beginning thinkers in stage three (Elder & Paul, 2010) have decided to change their thinking, but their initial attempts may be haphazard and frustrating. Their attempts to improve included beginning attempts to critique their own thinking and to benefit from the critiques provided by others. The self-critiquing could include recognizing and assessing their assumptions, which was an important aspect of Brookfield’s model (2012), and beginning to understand possible multiple points of view (Perry, 1970). In the Perry scheme, the beginning thinkers were located in positions three and four. If not guided carefully, these students may quickly reach frustration levels and overload cognitively (Paas, Renkle, & Sweller, 2003). This overload can lead the students to temporize, retreat, or escape (Perry, 1970). Elder and Paul indicated that adequate scaffolding can help to avoid or mitigate the overload and allow the student to persevere to the next stage. This scaffolding allowed the student to progress through Schlossberg’s (1981) “taking stock” transition stage, in which they examine their assets: the situation, self, support and strategies.

Practicing thinkers in stage four (Elder & Paul, 2010) have begun to take charge of (Schlossberg, 1981) and to systematize their conscious intellectual development. Thinkers at this stage have attempted to make metacognition a routine part of their thinking, although their skills here were still quite limited (Elder & Paul). The practicing thinker has recognized that further development was needed, and has decided to make that effort. According to Elder and Paul, this metacognition will involve applying the

standards: clarity, accuracy, precision, relevance, and logicalness. Elder and Paul implied that other standards exist, as well.

Elder and Paul (2010) stated that secondary school students should aim for this stage of critical thinking. In the Perry scheme (1970), the practicing thinkers were located in positions four and five, which is the hoped-for position by graduation from college. Baxter Magolda (1982) indicated that her research found students did not reach this stage of thinking until well after college graduation (see Table 1, p. 90).

This development will be most effective and efficient if the student is encouraged to identify and question assumptions (Brookfield, 2012) and to realize their implications (Elder & Paul, 2010) in a safe environment. That safety can include preparing them for and providing scaffolding against the frustrating and identity-threatening (Chickering, 1968) challenges of assessing assumptions (Brookfield) and stretching to understand multiple points of view (Perry, 1970). This preparation can help mitigate or prevent regression to earlier stages or positions.

Advanced thinkers in stage five (Elder & Paul, 2010) have begun to practice routine metacognition with occasional regressions, and have begun to pose questions about what they do and do not know. These thinkers could recognize multiple, valid points of view and could make conscious, ethical choices among these positions, placing them in Perry's (1970) positions six and seven. Their metacognition allowed them to identify and correct errors in their thinking, sometime even as they were committing these errors (Elder & Paul). This stage of thinking was not achieved until some times after college graduation (Elder & Paul; Baxter Magolda, 2001).

Accomplished thinkers in stage six (Elder & Paul, 2010) exhibited routine metacognition with few, if any, regressions, and routinely posed solid questions about what they did and did not know. Metacognition has become habitual and reflexive. Their actions integrated with their beliefs and assumptions. These thinkers held Perry's positions eight and nine (1970).

Kohlberg. Questions of morality differ from those of epistemology and reflective judgment, since moral judgment derives from concepts of good, rather than epistemic assumptions (King & Kitchener, 1994). The first discusses how we should act, and the second where our knowledge comes from, and how we can discern it. They are similar in the degree of relativity and attention to context.

Kohlberg (1981) proposed six stages of moral development, which he subdivided into three Piagetian categories: preconventional, conventional, and postconventional and principled. He listed a fourth transitional category, splitting stages four and five. Kohlberg stated that the stages were invariant and hierarchical, and he rejected the existence of regression in moral development. He attributed this invariant and irreversible progress to "an universal inner logical order of moral concepts" (p. 137) and rejected an effect from educational processes or biological causes. Kohlberg did not propose explanations to account for why some people made shifts in moral development and others did not.

Each of the moral stages depended on a correspondingly complex epistemological position, since the ability to understand and wrong as contextually-bound or relative required an increasingly complex level of intellectual facility and built on the logic of the earlier stages (Clinchy, Lief & Young, 1977; Kohlberg, 1981). While students in a given

moral stage had the tools of earlier stages available to them, Kohlberg assumed the students would prefer higher level operations over lower. The epistemological positions were prerequisites for the corresponding moral stage, although Kohlberg stated that shifts in epistemology did not necessitate shifts in moral development.

The preconventional level, or level A, comprised two stages (Kohlberg, 1981). Stage one was the stage of punishment and obedience. External authorities dictated right and wrong, and the goals of people in this stage were to avoid breaking rules and damaging property or people and thus to avoid punishment. Because this egocentric stage could not conceive of varying perspectives, the psychological or emotional condition of others was not considered by this stage.

Stage two was more instrumental and transactional. People in this stage considered personal gain or advantage paramount, although following the terms of an agreement was also important (Kohlberg, 1981). This stage recognized that others have their own interests, and that the interests of authority figures may not parallel their own. Rightness consisted of each person receiving the same amount or same treatment.

The conventional level, or level B, also comprised two stages in which the needs of others and of society became relevant to the person. In stage three, social acceptance and maintaining family and social relationships drove notions of right and wrong, and loyalty, trust, respect, and gratitude were prized. Empathy began to surface, and shared interests became equal or superior to self-interest. However, in stage three, concepts of right and wrong still centered on the self.

In stage four, the person recognized right as following the laws and protecting the wellbeing of others, except for in unusual conditions (Kohlberg, 1981). External systems

became more important than self-interest, and individuals were seen in terms of the systems to which they belong. People entering this stage derived their sense of right and wrong from external sources. Kohlberg also identified a transitional level, which he termed B/C. In this transitional level, the person began to see right and wrong as personal and arbitrary. Social mores and guidelines, since they were arbitrary, could be chosen and enforced as the individual preferred. No absolutes in terms of right and wrong existed.

The final level, postconventional and principled, comprised the stages five and six. In this level, the person recognized that society constructed values and principles that defined right and wrong. These values and principles could vary from society to society and depended on the acquiescence of members for their force and existence.

In stage five, values and principles formed the basis for the written laws of a society (Kohlberg, 1981). Most values and principles were relative to a society and should be upheld by the society's members, although certain values were seen as inalienable and universal. A "higher" law may be invoked in cases where an apparent conflict between these values systems existed, as long as this higher law supported the values of the society or the inalienable values of humanity. Stage five was utilitarian in cases where the underlying principles do not provide clear guidance (Kohlberg).

In stage six, social values and laws became clearly subordinate to universal values (Kohlberg, 1981). Because people in stage six feel committed to these universal values, disobedience to laws was required when these laws violated the values, and activity to correct these unjust laws was also required. The people in stage six used these values to generate personal decisions and actions. Personal interest and social interest were less

important than these values. However, most social mores and laws derived from universal values, and most societies constructed their mores and laws from them, although the exact expression of these values could appear different.

Summary of Review of Literature

Public policy should be driven by reason and thought and should be evaluated rationally. It appears that much of the program growth and development in credit-based transition programs, especially joint enrollment, has been driven by questions of convenience, economics, and staffing, rather than a consideration of what is academically sound and best for the students involved. The measures of success currently used for credit-based transition programs appeared to rely on politically expedient criteria, and appeared to have little to no grounding in educational or cognitive theory. The intent of these programs was to accelerate and better prepare students for the academic demands of college. With these aims, the relatively shallow literature dealing with the evaluation of credit-based transfer programs focused on the data easily drawn from registrar's records: persistence, progress to degree, time to degree, GPA, and number of majors and minors earned. As proxies for academic growth, these measures also have met with criticism as insufficient to indicate the success of college programs (Arum & Roksa, 2011; Pascarella, Blaich, Martin, & Hanson, 2011). This criticism helped to shape the direction and intent of this study.

Advanced placement did have a fairly robust literature to support its effectiveness in making gains in the chosen measures of success. The primary cause of concern was joint enrollment. Not only did joint enrollment program development appear unsound in its theoretical grounding, but issues of political expediency, economic concerns, and

convenience of the students and administration rather than reasoned and thoughtful processes drove the expansion. While it may be preferable for students to engage in acceleration programs because they need or desire the additional academic challenge, the shifting target population for these programs and the concomitant rapid growth in enrollment nationwide raised suspicions. If the joint enrollment students were as academically aggressive as enrollment trends indicate, it would seem unlikely that the remediation rate in colleges would be as high as it currently is. Therefore, many observers, including college presidents and admissions officers, have suspected that the enrollment has been driven by desires to reduce college expenses, since many of these programs charge either reduced or no tuition to the students.

The lack of solid theoretical grounding for the program development of credit-based transfer programs can result in unintended consequences for the students who enroll in these programs. They can be accelerated beyond their resources, and the consequences of this acceleration remain uninvestigated, although research examining college attrition has indicated that this can lead to problematic results (Pascarella & Terenzini, 1991; Tinto, 1987). This study seeks to begin grounding the evaluation and assessment of credit-based transition programs in sound theory.

Chapter 3

Research Methods

This study examined the intellectual development of first-year college students based on their participation in credit-based transfer programs. The *Learning Environment Preferences* (LEP) inventory was used to place the students on the Perry (1970) scheme of intellectual and ethical development. Credit-based transfer programs were defined as advanced placement or joint enrollment classes. Joint enrollment classes included classes that provide college credit while the student is still enrolled in high school. These classes can take place on the college campus or high school campus, or online. The online classes may or may not be supervised by a local high school teacher or other employee. The research hypothesis was that students enrolled in credit-based transfer programs should score higher on the LEP than regular high school program students.

Research Design

The study used a descriptive, retrospective (Johnson, 2000) quantitative design to determine if credit-based transfer programs correlated with transitions in the positions of intellectual development of first-year college students. If a correlation was identified, the study attempted to define the source and size. The study analyzed demographic and academic records from the target institution's databases and the first-year college students responses to the *Learning Environment Preferences* (LEP) (Moore, 1989), which was administered in September, 2010.

The *Measure of Epistemological Reflection* (MER), which is a production instrument, (Baxter Magolda & Porterfield, 1985) was considered for use in this study but was rejected. At first, the more nuanced level of insight afforded by the MER was attractive to

the primary investigator. The time required for completion was one factor in the rejection of the instrument; the MER could easily take more than an hour to complete for people with more complex intellectual development positions (Baxter Magolda, M. B. personal communication June 25, 2011). Scoring also posed significant issues, since the MER required two trained raters, who must establish inter-rater reliability prior to scoring the instruments. With the volume of instruments desired for this study, the raters would need to recalibrate at each scoring session, adding to the time and expense required.

The final choice of inventory was made after reviewing the additional expense of scoring the MER and the time required for both administration and scoring. The LEP and MER have a high degree of reliability (Baxter Magolda, M. B. personal communication June 25, 2011; Moore, W., personal communication June 28, 2011). The LEP could be expected to yield higher Perry scores than the MER (Moore 2000) because it was a constructed response rather than a production response inventory. Taking these factors into consideration, the decision was made to use the LEP in an attempt to use time and resources more efficiently.

Participants' were assigned to one of four cohorts, based on exposure to credit-based transfer programs: regular high school program, advanced placement, joint enrollment, and both advanced placement and joint enrollment. A student did not need to have transferred credit from a credit-based transfer program to qualify for placement in a credit-based transfer program cohort: simple enrollment in a college-level class or having taken the advanced placement exam in a subject was sufficient. The dependent variable was intellectual development position as defined by Perry (1970) and measured by the LEP (Moore, 1989). The study also gathered data regarding frequency of exposure,

curricular areas of credit-based transfer classes, enrollment in developmental classes, and a range of demographic information:

- a. Gender
- b. Age
- c. High school GPA
- d. ACT scores
- e. SAT scores
- f. Milieu of the credit-based transfer program
- g. First semester, first-year GPA
- h. Athletic participation
- i. Co-curricular participation
- j. Persistence to spring semester

The first-year GPA considered only the grades earned in fall semester at the target university. Any transfer GPA from the credit-based transfer programs were accounted for in the high school GPA.

Research question. Do four groups of high school graduates (regular program, advanced placement program, joint enrollment program, and both advanced placement program and joint enrollment program) differ in intellectual development position upon matriculation to a residential university?

Subquestions.

1. Does the frequency of exposure to credit-based transfer programs, as measured by attempted advanced placement testing or as measured by

transferred credit hours have an association with relative progress through intellectual positions?

2. Does participation in credit-based transfer programs in the humanities and social studies have a greater positive association with students' intellectual development than participation in programs in other subject areas?
3. Does participation in credit-based transfer programs have an association with placement into college developmental classes, based upon institutional placement scores?
4. Do demographic and academic performance factors have an influence on relative progress through intellectual positions?

Research hypotheses. This study examined the intellectual development of first-year college students based on their participation in credit-based transfer programs. Research hypotheses were developed and tested to confirm or reject the advantages that students participating in credit-based transfer programs may have over regular program students. The research hypotheses follow below.

1. Participants in advanced placement programs will have a higher score on a measure of intellectual development than participants in joint enrollment programs.
2. Participants in joint enrollment programs will have a higher score on a measure of intellectual development than participants in regular high school programs.

3. Participants in advanced placement programs will have a higher score on a measure of intellectual development than participants in regular high school programs.
4. Participants in both advanced placement programs and joint enrollment programs will have a higher score on a measure of intellectual development than participants in only advanced placement programs.
5. Participants in both advanced placement programs and joint enrollment programs will have a higher score on a measure of intellectual development than participants in only joint enrollment programs.
6. Participants in both advanced placement programs and joint enrollment programs will have a higher score on a measure of intellectual development than participants in regular high school programs.
7. Participants in a greater number of credit-based transfer programs, as measured by transferred credit hours or attempted advanced placement exams, will have a higher score on a measure of intellectual development than participants in fewer programs.
8. Participants in credit-based transfer programs in the humanities and social studies will have a higher score on a measure of intellectual development than participants in programs in other subject areas.
9. Participation in any credit-based transfer programs will result in a lower frequency of placement into college developmental classes.
10. Demographic and academic performance factors will have no influence on relative progress through intellectual positions as measured by the LEP.

Site of Research

The study was conducted at a private, residential, church-affiliated master's degree granting university in the Midwest. The primary investigator was employed by the target university as experience coordinator of the first-year program. The first-year experience program evaluation plan at the target university provided an existing database from which the database for the study was developed.

Population and Sample

The study's population included the full range of matriculating students at the target university, from honors to developmental students. For the purposes of the study, a matriculate was a student enrolling in full-time study at the university level for the first time. Any transfer credit must have been earned as a high school student. The sample was comprised of four cohorts of matriculates to a private, residential, church-affiliated master's degree granting institution. The cohorts were divided according to exposure to credit-based transfer programs: advanced placement program, joint enrollment program, both advanced placement program and joint enrollment program, and regular high school program. The cohorts were also subdivided by the demographic and academic success data.

The total potential population for the study was 254 students. For the analyses, the number was reduced due to missing data in some student records. The regular program cohort included 177 students at the beginning. The advanced placement cohort began at 20 students. The joint enrollment cohort began at 48. The cohort that included students with exposure to both advanced placement and joint enrollment programs began at 9 students. This was the only group that did not lose any participants due to cleaning.

This last cohort, which enrolled in a highly aggressive academic program, may have been influenced by a possible selection effect. The results for this group may have been influenced as much by family background and motivation as by the coursework and expectations of the credit-based transfer programs.

Data Collection

The university studied in this research was the primary investigator's employer at the time of the data collection and the analysis. His responsibilities included coordination of the first-year experience program at the target university, and he taught a section of the first-year experience seminar well. The program evaluation data for the first-year experience program provided an existing database for the study. He also taught one section of first-year composition each semester at the university and directed the writing center.

Because the LEP comprised part of the first-year experience program evaluation plan, the first-year experience instructors administered the survey in the first two weeks of the fall semester to keep the program evaluation on its required calendar for the institution. Prior to the distribution of the LEP to the first-year experience classes, the response sheets were coded to preserve the students' identities. The primary investigator established the coding procedure for the first-year experience program evaluation.

The first-year experience instructors were given the latitude to administer the inventory on a day of their choice in the first two weeks of the fall semester. The instructors read the instructions on the LEP to the students and explained to the students that the coding on their response sheets was intended to ensure their anonymity in the course of the program evaluation. The instructions stressed that the responses should not

reflect any particular class but rather the student's "ideal" class. The survey took about 45 minutes to complete. Students who missed class on the day of the survey were contacted by the investigator and asked to complete the survey in the investigator's office.

After all sections had completed the LEP, the randomly-numbered response sheets were transmitted to the owner of the LEP for processing, per the contract granting permission to use the LEP. The scored survey responses were matched to the students' registrar information to form the data set for the program evaluation. This evaluation database provided the data for this retrospective study. Data collection to identify participants' credit-based transfer program status and cohort began with the collection of participant demographics from the registrar's database.

The FYE secretary copied the program evaluation database and entered the supplemental demographic information. After this, she coded the participants in this research project's database with random numbers (D-F11xxxx). The participants' names were removed from the project database, and the database was provided to the primary investigator for analysis. Her copy of the research project's database was destroyed. The primary investigator will keep the research project's database on a flash drive, which will be locked in the primary investigator's office. The study's database will be destroyed after three years.

Data Analysis

The data for this study was drawn from an existing database established for the program evaluation for the target university's first-year experience program. The target university contracted with The Center for the Study of Intellectual Development (CSID), which owns the LEP, to score the program evaluation responses. This scoring occurred in

November, 2011 and returned CSID the results via email to the primary investigator. The LEP returns two scores, the R Index and the Cognitive Complexity Index (CCI). The R Index reflects how much the respondent's range of scores correlates to a specific position in Perry's scheme (Moore, 2000). The R Index is presented as a percentage. The CCI scores are reported on a scale of 200- 599. A rating of 200, for example, indicates that a student is firmly positioned in Perry position two. Numbers diverging above or below this number indicate a position transitioning through this position. Only the CCI was considered in the data analysis, since this study examined only entering positions on the Perry scale and was not concerned with longitudinal results.

The data were analyzed using SPSS 20 and interpreted with the assistance of a graduate student consultant in the NEAR Center at the University of Nebraska-Lincoln. The dependent variable was the score on the LEP as expressed by the CCI. The independent variable was credit-based transfer program exposure, and the demographic information were included as covariates. The specific statistical tests conducted for the hypotheses are detailed below.

A data merge aggregated the LEP and the demographic data to allow for analysis of ratings based on participants' frequency and nature of credit-based transfer program participation, and for descriptive analysis of the demographic information drawn from the institution's database. The database was examined for missing data and outliers, and cleaned prior to the actual data analysis. Demographic data was analyzed using descriptive statistics such as frequencies and percentages.

Research hypotheses one through six. To test the hypotheses one through six, which compared the relative intellectual development of the four cohorts, the study's

cohorts were coded as shown in Table 2. The data for hypotheses one through five were taken from the cohorts' LEP scores. The LEP scores of the cohorts were analyzed using a one-way ANOVA. The Tukey HSD was conducted as a post-hoc test. The Levene test of homogeneity of variances was also applied for these hypotheses.

Table 2

Coding of Independent Variables

Variables for Study	Code in Database	Definition	Research Hypotheses
Credit-Based Transfer Program	Regular Program= 0	Regular program students took no credit-based transfer program classes in high school.	2, 3, 6
	Advanced Placement= 1	Advanced placement students took at least one advanced placement test during their high school career.	1, 3, 4
	Joint Enrollment= 2	Joint enrollment students took at least one college credit class while simultaneously enrolled in a fulltime status in a high school or in a high school equivalent home school program.	1, 2, 5
	Both Advanced Placement and Joint Enrollment=3	Students in this group took at least one advanced placement test during their high school career and at least one college credit class while simultaneously enrolled in a fulltime status in a high school or in a high school equivalent home school program.	4, 5,6
Frequency of Exposure to Credit-Based Transfer Program	The raw number of credit hours transferred and the number of advanced placement tests were used.		7

Table 2 continues

Variables for Study	Code in Database	Definition	Research Hypotheses
STEM/Non-STEM Credit-Based Transfer Program	Humanities and social sciences =1	Humanities and social sciences included economics and unclassified developmental education classes.	8
	STEM =2	STEM included business and computer science classes.	
	Both humanities and social sciences, and STEM= 3		
Credit-Based Transfer Program Participation and Developmental College Class Placement	Regular Program= 0	Regular program students took no credit-based transfer program classes in high school.	9
	Advanced Placement= 1	Advanced placement students took at least one advanced placement test during their high school career.	9
	Joint Enrollment= 2	Joint enrollment students took at least one college credit class while simultaneously enrolled in a fulltime status in a high school or in a high school equivalent home school program.	9
	Both Advanced Placement and Joint Enrollment=3	Students in this group took at least one advanced placement test during their high school career and at least one college credit class while simultaneously enrolled in a fulltime status in a high school or in a high school equivalent home school program.	9
Gender	Male=1		10
	Female=2		10

Table 2 continues

Variables for Study	Code in Database	Definition	Research Hypotheses
Age		The students' actual age was used in the data analysis.	10
High School GPA		The students' actual high school GPA was used in the data analysis.	10
ACT and SAT scores		The students' test score was used in the data analysis.	10
Milieu of the Credit-based transfer Program	College-Level Examination Program (CLEP)= 0	Students who score above a certain level on the CLEP, a test owned by the College Board, may be awarded credit for college classes.	10
	Community College=1	Students who took classes from a community college.	10
	Four Year Institution= 2	Students who took classes from a four year college or university.	10
First Semester First-year College GPA		The students' actual college GPA was used in the data analysis.	10
Athletic Participation	No=0	Students who did not participate in intercollegiate sports during their first year at college.	10
	Yes=1	Students who participated in intercollegiate sports during their first year at college.	10
Co-Curricular Participation	No=0	Students who did not participate in music, drama, or student government during their first year at college.	10
	Yes=1	Students who participated in music, drama, or student government during their first year at college.	10
Persistence to spring semester	No=0		10
	Yes=1		10

Research hypothesis seven. The data for this hypothesis included the cohorts' LEP scores and the frequency of exposure to credit-based transfer programs as revealed by the students' transcript records in the target university's registrar's office. The data were coded as shown in Table 2. To test this hypothesis, a Pearson correlation was conducted. After a correlation was found for the advanced placement cohort, a one way ANOVA was conducted to determine the significance of the difference.

Research hypothesis eight. The data for this hypothesis included the LEP scores of students and the coding of students into groups defined by the type of classes in which they enrolled, as revealed by the students' transcript records in the target university's registrar's office. The cohorts were coded as shown in Table 2. A one-way ANOVA tested this hypothesis.

Research hypothesis nine. The data for this hypothesis included the LEP scores of students placed into developmental classes upon matriculation to the target university as revealed by the students' transcript records in the target university's registrar's office. The scores of students who were not placed in these classes were not included in the testing. The cohorts were coded as shown in Table 2. An independent-samples t-test tested this hypothesis.

Research hypothesis ten. The data for this hypothesis included the LEP scores of the four cohorts of students based on their exposure to credit-based transfer programs with selected demographic data tested as co-variants. The data were coded as shown in Table 2. A Pearson correlation tested the data, and where a correlation existed, a t-test defined the level of the effect's significance. The covariates included the following demographic and academic success information:

- a. Age
- b. Gender
- c. High school GPA
- d. First semester first-year college GPA
- e. ACT score
- f. SAT score
- g. Athletic participation
- h. Arts and Student Life participation
- i. Persistence to spring semester
- j. Milieu of the credit-based transfer program

Chapter 4

Results

This study examined the intellectual development of matriculating university students at a private, residential, master's degree-granting institution in the Midwest. The major independent variable for the study was participation in credit-based transfer programs in high school. Credit-based transfer programs include advanced placement and joint enrollment. Joint enrollment classes are classes offered for college credit, typically at the high school and typically taught by high school teachers. The trend in secondary education is to increase the access and frequency of credit-based transfer programs for students, for a variety of motivations. The granting college or university is responsible for ensuring the quality and qualifications of the joint enrollment instructors.

The instrument used to measure the intellectual development of the students was the Learning Environment Preferences (LEP), developed by William Moore (1970). Only the Cognitive Complexity Index (CCI) was used. The CCI scales are reported on a scale of 200-599. The LEP was administered as a part of the program evaluation process for the first-year experience program at the target university in the first two weeks of the Fall 2011 semester. Additional demographic and academic success data were drawn from the target institution's admissions and registrar's databases. The specific tests conducted for the hypotheses are detailed in the analysis sections below.

Research Question

Do four groups of high school graduates (regular program, advanced placement program, joint enrollment program, and both advanced placement and joint enrollment

programs) differ in intellectual development position upon matriculation to a residential university?

Subquestions

1. Does the frequency of exposure to credit-based transfer programs, as measured by attempted advanced placement testing or as measured by transferred credit hours have an effect on relative progress through intellectual positions?
2. Does participation in credit-based transition programs in the humanities and social studies have a greater positive effect on students' intellectual development than participation in programs in other subject areas?
3. Does participation in credit-based transition programs have an effect on placement into college developmental classes, based upon institutional placement scores?
4. Do demographic and academic performance factors have an influence on relative progress through intellectual positions?

Research Hypotheses

This study examined the intellectual development of first-year college students based on their participation in credit-based transition programs. Research hypotheses were developed and tested to confirm or reject the advantages that students participating in credit-based transfer programs may have over regular program students. The research hypotheses follow below.

1. Participants in advanced placement programs will have a higher score on a measure of intellectual development than participants in joint enrollment programs.
2. Participants in joint enrollment programs will have a higher score on a measure of intellectual development than participants in regular high school programs.
3. Participants in advanced placement programs will have a higher score on a measure of intellectual development than participants in regular high school programs.
4. Participants in both advanced placement programs and joint enrollment programs will have a higher score on a measure of intellectual development than participants in only advanced placement programs.
5. Participants in both advanced placement programs and joint enrollment programs will have a higher score on a measure of intellectual development than participants in only joint enrollment programs.
6. Participants in both advanced placement programs and joint enrollment programs will have a higher score on a measure of intellectual development than participants in regular high school programs.
7. Participants in a greater number of credit-based transition programs, as measured by transferred credit hours or attempted advanced placement exams, will have a higher score on a measure of intellectual development than participants in fewer programs.

8. Participants in credit-based transition programs in the humanities and social studies will have a higher score on a measure of intellectual development than participants in programs in other subject areas.
9. Participation in any credit-based transition programs will result in a lower frequency of placement into college developmental classes.
10. Demographic and academic performance factors will have no influence on relative progress through intellectual positions as measured by the LEP.

Findings

The means of the students in these populations fell in the 300 range on the Cognitive Complexity Index of the LEP, indicating that most were in position three, or the beginnings of complex dualism. This appears to run counter to Baxter Magolda's schedule of absolute knowing in Table 2 (2001) dominating the first-year students. However, it does match the findings by Clinchy, Lief, and Young (1977) and the studies they cited.

Analysis by Cohort

The first six hypotheses were tested together, using a one-way ANOVA. Statistics for each analysis were based on cases with no missing data for any variable in the analysis. Cleaning the data to remove participants with missing data reduced the sample tested for these hypotheses to 239 students. After cleaning, the regular program students numbered 166, the advanced placement students numbered 18, the joint enrollment numbered 46, and students exposed to both advanced placement and joint enrollment numbered 9.

The ANOVA indicates that a significant difference existed among the four cohorts' LEP scores, $F(3,235) = 4.06$, $p = 0.008$. Table 3 presents the mean LEP scores and the standard deviations for the four cohorts. Because of the wide variability in the size of the cohorts, the Levene test of homogeneity of variances was also applied for these hypotheses, but found no significant influence of cohort size ($\text{sig} = .169$). This result indicates that the variability in the size of the groups was not a likely source of error.

Table 3

Means and Standard Deviations for LEP Scores of Four Cohorts

	N	Mean LEP score	Standard deviation
Regular Program			
Advance placement	18	334.83	54.045
Joint enrollment	46	309.09	44.054
Both advanced placement and joint enrollment	9	354.33	56.703
Total sample	239	313.74	46.658

The Tukey HSD was conducted as a post-hoc test to determine which of the hypotheses formed the locus of the difference detected in the ANOVA. The results of the Tukey HSD tests for each of the first six hypotheses are shown below in Table 4, which provides the probability values and 95% confidence intervals for the four cohorts. The discussion of the data in Table 4 follows.

Table 4

Tukey HSD Probability Values and 95% Confidence Intervals for Exposure to Credit-based Transfer Program

	Tukey HSD	95% CI
Advanced placement vs joint enrollment	0.183	-7.19 to 58.68
Regular high school program vs joint enrollment	0.998	-18.28 to 21.19
Regular high school program vs advanced placement	0.144	-53.69 to 5.11
Advanced placement vs both advanced placement and joint enrollment	0.724	-67.86 to 28.86
Joint enrollment vs both advanced placement and joint enrollment	0.036*	-88.42 to -2.07
Regular high school program vs both advanced placement and joint enrollment	0.029*	-84.34 to -3.25

Post hoc comparisons using the Tukey HSD test for the first hypothesis indicate that the mean score for participants in advanced placement programs ($M = 334.83$, $SD = 54.05$, 95% CI [307.96, 361.71]) is not significantly different from the mean score for participants in joint enrollment programs ($M = 309.09$, $SD = 44.54$, 95% CI [296.00, 322.17]), $p = .183$. Therefore, hypothesis one is rejected. This suggests that exposure to advanced placement and joint enrollment programs alone does not result in a significant difference in intellectual development.

Post hoc comparisons using the Tukey HSD test for the second hypothesis indicate that the mean score for participants in joint enrollment programs ($M = 309.09$, $SD = 44.54$, 95% CI [296.00, 322.17]) is not significantly different from the mean score for participants in regular high school programs ($M = 310.54$, $SD = 44.71$, 95% CI [303.69, 317.39]) $p = .998$. Therefore, hypothesis two is rejected. This suggests that

exposure to joint enrollment and regular high school programs alone does not result in a significant difference in intellectual development.

Post hoc comparisons using the Tukey HSD test for the third hypothesis indicate that the mean score for participants in advanced placement programs ($M = 334.83$, $SD = 54.05$, 95% CI [307.96,361.71]) is not significantly different from the mean score for participants in regular high school programs ($M = 310.54$, $SD = 44.71$, 95% CI [303.69,317.39]) $p=.144$. Therefore, hypothesis three is rejected. This suggests that exposure to advanced placement and regular high school programs alone does not result in a significant difference in intellectual development.

The finding that joint enrollment programs and advanced placement programs did not significantly improve the LEP scores of participants when compared to regular high school programs supports the idea that the credit-based transfer program students may be cocooning, or to use Perry's term, temporizing. As Perry stated (1970), temporizing serves a positive purpose if the student is in fact preparing for the needed shift into a more complex intellectual development position. This determination was beyond the scope of this study.

The finding that exposure to only a single form of credit-based transition program does not correlate with greater intellectual development reinforces suspicions of these programs' validity as providing true college-level experiences. The rejection of hypothesis two in particular appears to confirm the fears of the university presidents in the Iowa Education summit and of many in higher education. Students in joint enrollment classes did not score significantly better on the LEP than their peers in regular high

school program classes, indicating that it may be an insufficient treatment, in isolation, to advance intellectual development.

Post hoc comparisons using the Tukey HSD test for the fourth hypothesis indicate that the mean score for participants in both advanced placement programs and joint enrollment programs ($M = 313.74$, $SD = 46.66$, 95% CI [310.75,397.92]) is not significantly different from the mean score for participants in only advanced placement programs ($M = 334.83$, $SD = 54.05$, 95% CI [307.96, 361.71]) $p=.724$. Therefore, hypothesis four is rejected. This suggests that exposure to both advanced placement programs and joint enrollment and only advanced placement programs alone does not result in a significant difference in intellectual development.

Post hoc comparisons using the Tukey HSD test for the fifth hypothesis indicate that the mean score for participants in both advanced placement programs and joint enrollment programs ($M = 313.74$, $SD = 46.66$, 95% CI [310.75,397.92]) is significantly different from the mean score for participants in only joint enrollment programs ($M = 309.09$, $SD = 44.54$, 95% CI [296.00, 322.17]) $p=.036$. Therefore, hypothesis five is accepted. This suggests that exposure to both advanced placement programs and joint enrollment and only joint enrollment programs alone may result in a significant difference in intellectual development.

Post hoc comparisons using the Tukey HSD test for the sixth hypothesis indicate that the mean score for participants in both advanced placement programs and joint enrollment programs ($M = 313.74$, $SD = 46.66$, 95% CI [310.75,397.92]) is significantly different from the mean score for participants in regular high school programs ($M = 310.54$, $SD = 44.71$, 95% CI [303.69, 317.39]) $p=.029$. Therefore, hypothesis six is

accepted. This suggests that exposure to both advanced placement programs and joint enrollment and only regular high school programs alone may result in a significant difference in intellectual development.

The results of the ANOVA and the Tukey HSD tests reveal that the cohort pairings for hypotheses two and four appear similar: regular program and joint enrollment, and advanced placement and exposure to both advanced placement and joint enrollment. This similarity may lie in the perceptions of relative difficulty and availability of academic support, either in the high school or in the college setting. Further research on this topic may prove illuminating regarding intellectual similarities and the motivations of these two groups. Also, the current study did not delve into the socioeconomic status or parental education levels for the participants, and such a study may also yield important insights for both groups of cohorts.

The relatively low power of the advanced placement cohort and the cohort exposed to both advanced placement and joint enrollment reduces the value of these findings: very small group sizes must generate large differences in order to create a statistically significant difference, especially given the large standard deviations within the groups. The low power also renders the potential similarity suspect. Further investigation here maybe warranted.

The rejection of hypothesis four indicated that students exposed to both advanced placement and joint enrollment programs did not score significantly higher than advanced placement-only students. This finding indicates that a wider variety of credit-based transfer programs did not yield a greater degree of intellectual development. While the Levene's test of homogeneity did not reveal significant differences among the groups, the

result of only .169 significance appears weak to the primary investigator, when coupled with the high variance as shown by the standard deviations and with the low power of the cohorts exposed to advanced placement and both advanced placement and joint enrollment programs. This low power and high degree of variance of the two cohorts may have failed to reveal a statistically different result. Therefore, the findings for research hypothesis four must be viewed with some skepticism. A similar concern exists for research hypotheses one and three. Further research, either with a larger and more universal single year sample or a longitudinal sample at the target university, would appear to be in order.

Hypotheses five and six revealed significantly lower LEP scores for regular program and joint enrollment-only students, when compared to the LEP scores of students with exposure to both advanced placement and joint enrollment classes. When compared to each other, none of the programs taken in isolation prove significantly superior in advancing intellectual development. Leaving the power issue for the advanced placement cohort out of the question, the fact that regular programs, advanced placement, and joint enrollment programs were statistically equivalent may reflect on the explicit and implicit aims of the programs, or it may speak to the inherent conditions of the matriculating students. These inherent conditions span the physical and the intellectual.

Most credit-based transfer program classes take place in the high school milieu, which may not provide enough intellectual and emotional pressure to cause the students to expend the intellectual and emotional energy required for a successful transition to a more complex intellectual development position. This is not meant to imply that advanced placement and joint enrollment classes do not provide appropriately difficult

academic content. However, a college class' pacing is considerably more intense, with more independence expected of the students. The efforts by the National Alliance of Concurrent Enrollment Partnerships (NACEP) to develop accreditation standards are an effort by the colleges and school districts to provide some assurances about the quality of joint enrollment programs. The findings regarding joint enrollment in this study confirm that such measures are needed.

Analysis by Frequency

Pearson product-moment correlation coefficients were computed to assess the relationship between frequency of exposure to advanced placement programs and LEP scores and between frequency of joint enrollment and LEP scores. Table 5 presents the descriptive statistics, correlations, and results for regression analysis for LEP score and frequency of exposure to credit-based transition programs. A strong, positive correlation exists between the frequency of exposure to advanced placement and LEP scores; $r = .19$, $n = 239$, $p = .002$. No correlation exists between the frequency of exposure to joint enrollment and LEP scores; $r = .007$, $n = 239$, $p = .46$. Overall, increased exposure to advanced placement programs is correlated with higher LEP scores, while exposure to joint enrollment programs is not correlated with increased LEP scores. The ANOVA indicates that a significant difference exists among the two cohorts' LEP scores, $F = (3,236) = 4.40$ $p = 0.013$. Exposure to advanced placement programs accounts for up to 3.6% of the variance in LEP scores overall. While significant, the variance accounted for is not large enough to be important.

Table 5

Descriptive Statistics, Correlations, and Results for Regression Analysis for LEP Score and Frequency of Exposure to Credit-based Transition Programs

	Mean	Std. Deviation	N	Pearson R	B	β
LEP Score	313.74	46.658	239			
Number of AP tests taken	0.2887	0.94175	239	0.19	9.42	0.19
Joint enrollment classes	2.46	5.642	239	0.007	-0.69	-0.008

Analysis by Curricular Areas

A one-way ANOVA was used to compare the relative effects of exposure of credit-based transfer programs in different curricular areas. This sample consisted only of students with exposure to credit-based transfer programs. For the sake of the study, all participants were assigned to one of three categories: those who enrolled in only humanities and social sciences classes, those who enrolled in science, technology, engineering, and math (STEM) classes, and those who enrolled in both humanities and social sciences and STEM classes. Economics and unclassified developmental education classes are assumed to be part of the humanities and social sciences, and business and computer science classes are assumed to be part of STEM.

The ANOVA indicates that no significant differences exists among the three categories' LEP scores, $F(2,62) = 1.356$, $p = 0.265$. Table 6 presents the mean LEP scores and the standard deviations for the three categories. Because of the wide variability in the size of the categories, the Levene test of homogeneity of variances was also applied for these hypotheses, but found no significant influence of category size

Table 6

Mean and Standard Deviation for LEP Score and Curricular Divisions

	N	Mean	Std. Deviation
Humanities and social sciences	18	331.11	47.621
STEM	15	302.40	49.839
Humanities and social sciences, and STEM	32	319.00	51.175
Total	65	318.52	50.198

(sig = .980). This result indicates that the variability in the size of the groups was not a likely source of error.

Analysis by Developmental Placement

An independent-samples t-test was conducted to compare exposure to credit-based transition programs to enrollment in college-level developmental classes. The test reveals a significant difference in the enrollment in developmental classes for students exposed to credit-based transfer programs ($M = .35$, $SD = .89$) and for students not exposed to credit-based transfer programs ($M = 1.04$, $SD = 1.45$); conditions $t(224) = 4.64$, $p < .001$. These results suggest that students who participate in credit-based transfer programs did not need to enroll in developmental coursework upon matriculation to the target university as frequently as regular program students.

Analysis by Demographic and Academic Success Factors

Pearson product-moment correlation coefficients were computed to assess the relationship between the LEP and the demographic and academic success data. Results for this test are based on all the cases with valid data for each pair. The tests for this hypothesis did not differentiate the students by exposure to credit-based transfer

programs, since this would have removed all but the students exposed to both advanced placement and joint enrollment classes. Tables 7 and 8 present the descriptive statistics for this hypothesis. Table 9 presents the Pearson product-moment correlation coefficients for LEP Score and demographic and academic success data.

Table 7

Descriptive Statistics for Demographic Data

	Sample	Population	Percentage
Age 17 and under	14	234	6.0%
Age 18	158	234	67.5%
Age 19	55	234	23.5%
Age 20	1	234	0.4%
Age 21	3	234	1.3%
Age 22	3	234	1.3%
Male	127	235	54.0%
Female	106	235	45.1%
Athletic Participation	110	239	46.0%
Arts and Student Life participation	38	239	15.9%
Non-persistence to Spring	31	239	13.0%
Two year institution	30	52	57.7%
Four year institution	22	52	42.3%

Table 8

Descriptive Statistics for Academic Success Data

	Mean	Std. Deviation	N
LEP Score	313.74	46.658	239
HS GPA	3.20	.611	252
GU GPA	2.92	.941	247
ACT Score	20.62	4.41	169
SAT Score	923.24	199.24	68

Table 9

Pearson Product-moment Correlation Coefficients for LEP Score and Demographic and Academic Success Data

	Pearson's R	Sig. (2-tailed)	N
Age	.010	.879	234
Gender	.052	.431	235
HS GPA	.058	.377	238
First Semester College GPA	.044	.507	234
ACT Score	.014	.834	226
SAT Score	-.019	.955	11
Athletics participation	-.079	.226	239
Arts and Student Life participation	.175**	.007	239
Persistence to Spring	.073	.260	239
Milieu of class	.164	.246	52

** Correlation is significant at .01 level (2-tailed).

As can be seen in Table 8, only one covariate showed a strong, positive correlation: Arts or Student Life participation. An independent-samples t-test was conducted to compare the LEP scores of students who participated in Arts or Student Life and students who did not participate in Arts or Student Life. The t-test reveals a significant difference for students who participated in Arts or Student Life ($M=332.73$, $SD=47.42$) and students who did not participate in Arts or Student Life ($M=310.26$, $SD=45.79$) conditions $t(237)2.73$, $p=.007$.

The results of the Pearson correlation indicate the relationships between LEP and all but one of selected demographic and academic success factors could be the result of chance, with the significance level ranging from .226 to .879. The significance level of .05 is met by only one factor: Arts or Student Life participation. This suggests that students who participate in Arts or Student Life appear to score higher on the LEP, indicating a more complex Perry position of intellectual development.

Chapter 5

Discussion, Conclusions, and Implications

High schools greatly increased credit-based transition program enrollments from 2001 to 2011 (Hargrove, Godin, & Dodd, 2009), as high schools sought to increase rigor and opportunities for advanced high school students. Credit-based transition programs include joint enrollment classes, which are typically offered on the high school campus by community colleges, and advanced placement classes, which are College Board-approved high school classes. Advanced placement students may be granted college credit if they pass a rigorous standardized subject matter exam. As college credit-bearing courses, all of these credit-based transition programs should significantly influence the intellectual development of students over regular high school programming. For the purposes of this study, intellectual development was defined using William Perry's scheme of intellectual and ethical development (1970) as a framework.

Over time, many reports have encouraged this expansion of access in an effort to increase rigor in the high school, spur student interest in class work, reduce time and student cost to post-secondary graduation, and to provide the students with anticipatory socialization (Bailey, Hughes, & Karp, 2002; Delicath, 1999; Hughes, Karp, Bunting, & Friedel, 2005; Karp, 2007). Because of this, enrollment in credit-based transition programs has been opened to include virtually any interested high school student, allowing them to enroll in and receive credit for general education or career and technical education college classes. While supporting laudable goals, these advocates have not critically examined the effectiveness of these programs. Because passing a joint enrollment class grants students college credit, these classes should be at least as effective

as advanced placement in advancing a student's intellectual development, if not more so, since teaching critical thinking is a universal goal of college general education programs (Moore, 2000; Pascarella & Terenzini, 1991; Perry, 1970).

The study's instrument was the *Learning Environment Preferences* (LEP) (Moore, 1989, 2000), a constructed response inventory designed to identify the intellectual development positions of participants according to William Perry's (1970) theory of intellectual and ethical development. The LEP presents 65 recognition items in five domains (Moore, 1989) that describe the student's preferred environment for learning. The environment includes not only the classroom, but also the expected behaviors and roles in the classroom for the instructor, the student and the peers. The five domains are "(a) views of knowledge and course content, (b) role of the instructor, (c) role of the student and peers in the classroom, (d) the classroom atmosphere, and (e) the role of evaluation" (Moore 1989, p. 506).

LEP is limited to placing a student in positions 2-5 on Perry's scheme. A score of 200, for example, indicates that the student is solidly in position 2, which is the higher position in simple dualism. A score of 250 would indicate that the student is in a transitional state. The scores of the study participants ranged from 200 to 440. Moore (1989) stated that positions 6-9 can only be determined using qualitative methods. In these advanced positions, the students begin to understand the contextual nature of knowledge and truth and begin to make or solidify commitments to their choices. The LEP can be completed easily within 30-45 minutes.

Purpose and Procedures

This study investigated whether credit-based transition programs had an effect on transitions in the positions of intellectual development of matriculating first-year college students at a private, residential, church-affiliated master's degree-granting university in the Midwest. If an influence was identified, the study attempted to define the source and size of this effect. The study analyzed demographic and academic records from the target institution's databases and the first-year college students' responses to the LEP, which was administered as a part of the program review and evaluation for the first-year experience program at the target university in September, 2011. The LEP was to determine whether credit-based transition programs have this desired effect on intellectual development.

The study's population included the full range of first-year students in the Fall 2011 semester at the target university, from advanced to developmental students. The total potential population for the study was 254 students. For the analyses, the sample was reduced by missing data in some student records. This cleaning of the data will be addressed in the discussion for each hypothesis. The sample was divided into four cohorts according to exposure to credit-based transfer programs: advanced placement, joint enrollment, both advanced placement and joint enrollment, and regular high school. The cohorts were also subdivided by the demographic and academic success data.

The data for the dependent variable were gathered from the LEP administration by the first-year experience program at the target university, which gathered the data for program evaluation purposes. The data for the independent variables was obtained from the registrar's database at the target university. Categorical data used to address the

research hypotheses included several independent variables: exposure to types of credit-based transfer program; curricular origination of the credit-based transfer class; placement in developmental college classes; gender; milieu of credit-based transfer program; participation in athletics, fine arts or student government; and persistence to the Spring 2012 semester at the target university. The demographic and transcript data did not specify the milieu of the joint enrollment classes. This fact forced the assumption that the classes provided by community colleges were provided in the high school campus by qualified high school teachers, and that classes provided by four-year institutions were provided on the college's campus by college faculty.

Continuous data used to address the research hypotheses included the dependent variable, the LEP score and several independent variables: the frequency of exposure to credit-based transfer programs; age; high school GPA; college GPA at the target university; ACT and SAT scores; and number of hours enrolled in the fall semester at the target university. These categorical variables were coded numerically, while the continuous data were used without coding. The study was guided by the following research question, subquestions and the resulting hypotheses.

Research question. Do four groups of high school graduates (regular program, advanced placement, joint enrollment, and both advanced placement and joint enrollment) differ in intellectual development position upon matriculation to a residential university?

Subquestions.

1. Does the frequency of exposure to credit-based transfer programs, as measured by attempted advanced placement testing or as measured by

transferred credit hours have an effect on relative progress through intellectual positions?

2. Does participation in credit-based transition programs in the humanities and social studies have a greater positive effect on students' intellectual development than participation in programs in other subject areas?
3. Does participation in credit-based transition programs have an effect on placement into college developmental classes, based upon institutional placement scores?
4. Do demographic and academic performance factors have an influence on relative progress through intellectual positions?

Research hypotheses. This study examined the intellectual development of first-year college students based on their participation in credit-based transition programs. Research hypotheses were developed and tested to confirm or reject the advantages that students participating in credit-based transfer programs may have over regular program students. The research hypotheses follow below.

1. Participants in advanced placement programs will have a higher score on a measure of intellectual development than participants in joint enrollment programs.
2. Participants in joint enrollment programs will have a higher score on a measure of intellectual development than participants in regular high school programs.

3. Participants in advanced placement programs will have a higher score on a measure of intellectual development than participants in regular high school programs.
4. Participants in both advanced placement programs and joint enrollment programs will have a higher score on a measure of intellectual development than participants in only advanced placement programs.
5. Participants in both advanced placement programs and joint enrollment programs will have a higher score on a measure of intellectual development than participants in only joint enrollment programs.
6. Participants in both advanced placement programs and joint enrollment programs will have a higher score on a measure of intellectual development than participants in regular high school programs.
7. Participants in a greater number of credit-based transition programs, as measured by transferred credit hours or attempted advanced placement exams, will have a higher score on a measure of intellectual development than participants in fewer programs.
8. Participants in credit-based transition programs in the humanities and social studies will have a higher score on a measure of intellectual development than participants in programs in other subject areas.
9. Participation in any credit-based transition programs will result in a lower frequency of placement into college developmental classes.
10. Demographic and academic performance factors will have no influence on relative progress through intellectual positions as measured by the LEP.

Findings by Cohort

The first three hypotheses were tested together to determine the effect of the primary independent variables, which was exposure to high school curricular programs on the dependent variable, which was the mean of the LEP score for each of the cohorts. The three credit-based transfer programs were regular high school program, advanced placement program, and joint enrollment program. Hypotheses four through six compared the combination of exposure to both advanced placement and joint enrollment programs to each of the three programs individually. Hypothesis four examined the effect of advanced placement-only exposure to exposure to both advanced placement and joint enrollment. As was shown in Table 2, the analyses revealed no significant differences for hypotheses one through four, leading to their rejection. Hypotheses five and six were accepted. These two hypotheses revealed significantly lower LEP scores for regular program and joint enrollment-only students when compared to the students with exposure to both advanced placement and joint enrollment classes.

The College Board requires advanced placement class syllabi to be approved before the classes can be taught as advanced placement, and the College Board and other organizations provide intensive professional development for advanced placement teachers in an effort to provide the same college-level assurances for these classes. The College Board also recommends that advanced placement teachers hold master degrees and have several years of successful teaching experience. The quality safeguards should lead to better results than in regular high school program classes, and these consistent and public safeguards are also more stringent than many college and university adjunct or graduate teaching assistant hiring policies. The findings regarding advanced placement

programs in this study are equivocal due to the concerns about the power of the sample. These findings and issues regarding requirements and expectations for instructors in other credit-based transfer programs are discussed in more detail below.

Another possible issue contributing to the finding that the three single treatment cohorts do not differ significantly in LEP position may come in the approach to support services in the different milieu. Students who select the more aggressive high school curricula represented by credit-based transfer programs tend to be more self-reliant and confident in their abilities to comprehend and complete the work required by their teachers, even to exceed those standards in many cases. When faced with the increased expectations that should characterize classes on a college campus, these students may delay or fail to display help-seeking behaviors that would gain them access to the college's support network (Williams & Takaku, 2011). At the college campus, extensive support networks exist but require the students' initiative to gain access. In the high school milieu, the closer monitoring provided by the faculty and staff means the students do not need to develop these help seeking behaviors to the same extent. This pre-existing social and academic network, which forms the cocoon discussed in the chapter one, can provide a level of comfort that allows the credit-based transfer program students to ignore or fail to recognize the intellectual pressure that the credit-based transfer program faculty and curricula are trying to bring to bear on them. Further study focusing on the precise milieu of the credit-based transfer programs may help to determine if this negative cocooning effect is in fact a consideration for policies governing credit-based transfer programs.

The literature review indicated a delay of the transition to a more complex intellectual development position may be an effect of credit-based transfer programs, and that this delay was not necessarily a negative result of these programs. The literature stated that these programs would permit their enrolled high school students to focus on experimenting with the role of college students, and that this would ease the transitional period once they arrived at college. The seamlessness of the transition provided by credit-based transfer programs may not be completely positive (Schlossberg, 2007), as stated in chapter two. What appears to be effective and helpful cocooning may also be an unintended sheltering from the academic pressures needed to build toward the shift in intellectual development position. This study was not intended to explore this cocooning effect.

Despite the academically aggressive profile of most advanced placement and joint enrollment students, if they feel threatened in their competence, or in their emotional stability, they may push the intellectual challenges to the side until they are able to reestablish their feelings of confidence and safety (Maslow, 1954). Given the magnitude of the social, personal, and academic transitions of the first year at college, Chickering's model (1968) would indicate that the matriculating college students will spend much of their first year in the first two vectors: competence and coping with emotions. It is possible that the positive effects of credit-based transfer programs may not become clear until the second semester or possibly even the second year of college. Only then might they be secure in the appropriate or founded confidence that they can do the things asked of them in their current or transitional role. As feelings of competence cycles, based on the perceptions of success of the shifting strategies adapted through experience in the

credit-based transfer program and then the college environments, the students' emotions will also cycle.

A peer group and stable support system, at both the students' high schools and their matriculating college, will help the credit-based transfer students to successfully make the transitions these two vectors pose for these students. The energy needed to maintain competence and manage emotions during the summer before matriculation would be diverted from shifts in intellectual position, and therefore it is entirely plausible that the matriculating credit-based transfer program students will appear to have derived no intellectual benefit from the programs.

If the explicit and implicit aims of credit-based transfer programs are the primary motivators for credit-based transfer programs rather than intellectual development, an issue that this research did not explore, future research must explore these aims to determine their relative effects on the intellectual development of the participating students. The explicit aims of joint enrollment are to increase rigor in the high school, to spur student interest in class work, to reduce time and student cost to post-secondary graduation, to provide the students with anticipatory socialization, and to expand curricular programming, especially in smaller and rural school districts. Advanced placement also shares these motivations, although not all of these are explicitly stated in their materials. These goals appear clearly related to efforts to improve the intellectual development of high school and matriculating college students. However, the latter goal appears to remain unmet in the current study, at least for students exposed to only advanced placement or joint enrollment.

The implicit goal of many regarding credit-based transfer programs is to use them to get general education classes “out of the way”. This attitude reflects a fundamental misunderstanding of the traditional aims of higher education. Using credit-based transfer programs in order to eliminate the required general education courses reduces these courses to an annoying obstacle, rather than an effective, intentional step in the development of the world perspectives and critical thinking skills required for success in the complex and competitive economy and political arena that the United States faces in the coming century. The question of motivation for credit-based transfer programs and the views of general education and the liberal arts are complex and unexplored facets of the evolving American education landscape, both at the secondary and post-secondary levels.

The general education program at colleges should feature a coherence that demonstrates the interconnection of the different curricular areas and the uses of their forms of inquiry on different issues. The credit-based transfer programs in the high school setting may be less able to provide this coherence, thereby contributing to the lack of significant difference between the credit-based transfer program students and the regular program students. If the students are not shown the intellectual life that college campuses nourish, they are not as likely to benefit from the extra- and co-curricular offerings that complete the educational foundation offered in the classroom.

At the Iowa Education Summit (Iowa Department of Education, 2011), college presidents stated some high school students are using joint enrollment to gain credits to transfer to a four-year college whose admissions criteria they would otherwise not meet. The presidents’ comments indicated a concern that poorly prepared joint enrollment

students would matriculate straight from high school and then flunk out of college with student loan debt loads they were ill-equipped to discharge. This use of transfer credit grants entry to the students, but does not necessarily provide them with the adequate academic background for success.

The findings for hypotheses one through three are troubling for public policy, given the investment in actual funding or in lost tuition income to the institution providing the joint enrollment classes. For example, in Iowa in 2011, high school students accounted for 300,077 credit hours of joint enrollment credit (Annual Condition 2012), or approximately 25,006.4 FTE. With average tuition and fees at Iowa's community colleges at \$143 for FY 2011, that equates to potential tuition of \$42,911,011. However, only 4.8% of the total joint enrollment in Iowa was paid at tuition rates. These tuition classes generated \$2,059,728.53 for the Iowa community college system. However, Iowa law required the student's school district to pay \$250 per class for each student who wishes to participate in joint enrollment. This fee must include both tuition and the rental of the textbook. Obviously, the fee did not meet the 2011 tuition and fees for even two credit hours, even though most college classes are three hours, and some range as high as five hours. This budgetary shortfall is worsened by the fact that the community college must provide the textbook at no cost for these students. Fortunately for the Iowa community colleges, this method of course provision accounted for only 8.1% of joint enrollment classes, or 24,306 credit hours, generating \$2,025,519.75 for the fifteen community colleges, but leaving them with a legislatively-driven budget shortfall of \$1,450,272.14 in FY 2011 (Annual Condition). The terms of the contracted classes varies between community colleges and the individual school districts, and these

arrangements generate weighted supplemental funding for the community college and the school, so it is more difficult to estimate the budget impact of this method.

The community colleges and high schools in Iowa have pursued the contracted format for joint enrollment classes in order to limit and control the budgetary impact of these classes, which they must offer, in the face of declining or stagnant state support. The finding that joint enrollment programs do not significantly improve the intellectual development of students over that of regular high school programming may indicate the need for additional quality control in the joint enrollment classes in the high school milieu and more consistent assessment of learning objectives to ensure that the joint enrollment classes are actually equivalent to the same classes on college campuses, and that both in fact meet the goals intended for these classes. This issue is discussed further in the section addressing the results of research hypothesis ten, which deals in part with the milieu of credit-based transfer programs.

Hypotheses five and six were accepted, indicating that the students exposed to both advanced placement and joint enrollment scored significantly better on the LEP than regular program and joint enrollment students. The power concern mentioned above regarding the advanced placement cohort must be considered in the discussion of this finding as well, although the combination of the two cohorts reduces concerns about power. Again, further research using a larger sample would be helpful in determining the accuracy of this finding.

Exposure to both advanced placement and joint enrollment may prepare students better than exposure to only joint enrollment because of the sustained academic pressure caused by the higher expectations in both programs. Students enrolled in credit-based

transfer programs tend to be more academically aggressive, and better at meeting the expectations of their high school teachers. If faced with only one form of additional challenge, they may be less likely to feel the need to accommodate shifts in their thinking and working for classes. Advanced placement classes apply their academic pressure on the same calendar as regular program classes, which the students are used to. They therefore may be able to meet the challenges without uncomfortable shifts in epistemology. The joint enrollment classes generally follow the same alternating day schedule common to most college campuses, while providing similar or more intense academic pressure. Again, that schedule may allow them some time and emotional room to conserve their current epistemology. The combination of differing paces and consistent academic pressures may push the students to expend the energy required for a successful transition in intellectual development in order to succeed in these classes.

The results of these hypotheses are encouraging, in that exposure to both advanced placement and joint enrollment programs appears to correlate with increased LEP scores. Increased intellectual development should lead to greater success in the intellectual challenges posed by life at a residential university. This should result in increased persistence to degree completion and increased college GPA, results found by other studies focusing on students who had been exposed to joint enrollment classes (Swanson, 2008; McComas, 2010).

Findings by Frequency of Exposure

The frequency of exposure to joint enrollment was not found to be a source of significant difference in LEP scores. This finding could call into question the sometimes quite aggressive encouragement that some students receive to enroll in as many joint

enrollment classes as possible. In some states, such as Texas, the state policy is to have all students have access to at least 12 semester hours of joint enrollment credit by the time they graduate from high school. If the findings that joint enrollment is no more effective than regular high school programming are supported by additional research, these expansionist policies may actually be counter-productive in producing the intellectual development desired in college graduates, and the unnecessary budgetary loads on both the high schools and the colleges.. These accelerated joint enrollment students may not becoming the kinds of critical thinkers and effective citizens this nation will need in the 21st century, since the data indicate that these students do not differ significantly from their non-accelerated peers.

Supporters of joint enrollment may counter by stating that the findings revealed statistical equivalence: joint enrollment students scored no higher on the LEP than regular program students, but they also did not score lower than regular program students. Therefore joint enrollment classes do no harm in intellectual development, may increase high school graduation rates, may reduce time to college graduation, and may reduce the cost to the students and their families. While this observation and these conjectures may be supported by some literature, they ignore the important psycho-social developments that occur in the first-year college classrooms. The first-year classes at college can and should provide the matriculating students with a peer group of students who are negotiating these challenging transitions to college together. At the target university and its peer institutions, that is a common goal, driven heavily by an understanding of Chickering's vectors (1968), especially establishing competence and managing emotions. That goal has led to the development of learning communities in many colleges and

universities, an innovation that becomes more difficult to administer, in the face of rising credit-based transfer program enrollment.

When students enter with joint enrollment credit that exempts them from some of the lower division general education classes, they miss out on these opportunities to make the transition to college in that community of transitioning peers. The other students in the upper division general education classes, and even in many of the students' lower division major classes will have completed the transition to college in previous semesters, reducing the matriculating students' access to that important peer group support. This could have the effect of increasing the students' sense of isolation on the new campus, and lead to an increased cognitive load, unneeded stress, and the attendant attrition risks for students.

A different finding, that joint enrollment did in fact correlate with higher LEP scores, would not change these transition-based objections or concerns regarding joint enrollment classes. Such a finding would have provided supporters with additional backing in their efforts to maintain or expand access to these programs, however. At the least, the loss of the psycho-social peer support in the college classroom would have come with the gain of increased intellectual development from the joint enrollment classes. As it is, the joint enrollment classes alone presently appear to provide no more than a potentially risky rolling start in terms of credit earned.

The stakeholders in this issue include students, parents, high school teachers and administrators, college faculty and administrators, governing boards, non-profit foundations, and state elected and appointed officials. These stakeholders need to carefully discuss and consider the aims and goals of American higher education. If the

goal is to move students more quickly and cheaply through the college curriculum, then joint enrollment may be a useful tool in achieving this goal, as increasing numbers of students are graduating from college with more than 12 hours of credit, and many are completing high school and transfer-focused associate's degree programs simultaneously. If the goal is to increase the preparation of students for increasingly competitive and complex American and world economies, then joint enrollment may, at best, be no more than a programmatically convenient way to increase the apparent rigor of classes without increasing high school payrolls significantly.

The frequency of exposure to advanced placement was a source of significant difference in LEP scores. However, the effect size of advanced placement frequency was low enough to render this difference irrelevant, despite its significance.

Findings by Curricular Areas

The humanities and social sciences address questions that encourage students to consider different perspectives and to support their positions with evidence. These facts drove the hypothesis that humanities and social sciences joint enrollment classes would increase their students' LEP scores more than joint enrollment classes in STEM, which are more likely to reward dualist thinking in students. As in the other hypotheses focusing on the advanced placement cohorts, the power obtained in the sample must be considered. Even with the low power, the small difference still reached significance. Clearly this hypothesis merits further investigation study using a sample with a higher power.

This rough equivalency of effect may be driven by a number of factors. Based on the professional development provided advanced placement teachers, and the advanced

degree held by most joint enrollment instructors, the teaching methods of the instructors in the STEM credit-based transfer programs may present the material in ways that encourage the perspective-taking that is generally thought to be the hallmark of the humanities and social sciences. A less optimistic explanation is also possible: given the results of the portion of hypothesis ten addressing the milieu of credit-based transfer programs, it is also possible to look at the results as suggesting that the humanities and social sciences teachers, perhaps driven by the imperative of standardized testing, also use methods that encourage dualist thinking, rather than the multiplist thinking that is more desired. In the current testing environment in the high schools, teachers are frequently encouraged or even required to “teach to the test”, especially advanced placement teachers. This can discourage addressing controversial or extreme positions, since the research and thinking required to address these positions can be quite consumptive of time and energy and take away from explicit test preparation. The literature indicates that seeking and addressing these controversial topics can lead to the very growth sought by this study. These contradicting explanations clearly indicate the inconclusiveness of this hypothesis and the need for further research. A study examining this hypothesis would benefit from a mixed methods approach, and a more careful identification of the milieu for credit-based transfer classes.

Findings by Developmental Placement

The finding that exposure to credit-based transfer programs correlated negatively with enrollment in developmental classes was encouraging. One of the goals of many who encourage or who participate in credit-based transfer programs is to reduce the time to degree completion. A major obstacle to on-time degree completion is placement in

developmental classes. These rarely count toward the satisfaction of general education or major requirements. The target university's placed students in developmental classes based on a combination of two of the three factors: ACT score of less than 21 or SAT scores of less than 970, placement in the bottom half of their high school class, and a high school GPA of less than 2.5.

Although credit-based transfer program exposure in isolation did not correlate with higher LEP scores, exposure to credit-based transfer programs also did not correlate with the factors which the target university has set for placement in developmental classes. This finding indicates that credit-based transfer programs do have some positive results as students enter college. A selection effect for the cohorts is not likely to be operative here although the study did not control for socioeconomic status or parental education. The study grouped the advanced placement and joint enrollment cohorts into a single cohort for this hypothesis. The credit-based transfer cohorts in isolation were not significantly different from the regular program cohort in LEP scores, but the credit-based transfer cohorts also qualified more frequently for direct entry into the regular education program at the target university. This allowed more of them to avoid the developmental classes, which have been correlated with higher degrees of attrition and longer time to degree.

Findings by Demographic and Academic Success Factors

Hypothesis ten was tested to determine the correlation of a series of covariates consisting of demographic and academic success data with the LEP scores of all participants with data for the covariates. Covariates were drawn from demographic and transcript data in the registrar's database at the target university. These data could not be

tested according to the four cohorts for the study since the cleaning process would eliminate all but the students with exposure to both advanced placement and joint enrollment programs. The correlations were completed using 239 participants after the records were cleaned for missing data.

The results of the Pearson correlation found that only one of the covariates rose to the level of significance: participation in the fine arts and student government. The discussion below takes the covariates in the order they are presented in Table 7.

Age and gender. As shown in Table 7, age should have had no significant effect, since the vast majority of the population was composed of traditional college students. Gender should also have had no significant effect, since the LEP had been validated to account for differences in gender (Moore, 1989). The rejection of the hypothesis that these demographic factors would correlate with LEP score was consistent with Moore's validation study.

Athletics participation. Athletics participation and LEP score were not expected to correlate. Of the sample of 239 remaining participants after the data was cleaned, 110 were identified in the records as participating in intercollegiate athletics. With this high level of participation rate of 46% in the study sample, it would be expected that the athletes' LEP scores would be normally distributed, as was true. The LEP scores for the athletes ranged from 200, the lowest score, to 430, the second highest score. The athletes also claimed the third highest score.

Another factor that predicted this lack of correlation is that at the competitive level at which these matriculating athletes entered, most were not expected to exhibit the initiative and leadership on the teams that characterize more advanced Perry positions.

Collegiate athletics participation requires solid time management skills and, especially at the entry level, a willingness to follow the dictates of the coaches and senior athletes. While this expectation did not prejudice against higher Perry positions, neither did it appear to prefer these more advanced positions.

Arts and student life participation. Arts and student life participation were expected to correlate with the LEP score, and this variable did. Of the sample of 239 remaining participants after the data was cleaned, 38 were identified in the records as participating in arts and student life. This relatively low participation rate of 15.9% made it more likely that a strong correlation might be found. In fact, the correlation was surprisingly strong. The LEP scores for students participating in arts and student life ranged from 247 to 421, the fourth highest score.

Matriculating students opting for leadership or arts activities in college should score highly on a measure of intellectual development. Performance in music, art, or drama at the collegiate level indicates a level of intellectual curiosity and adaptability that is inconsistent with the early Perry positions. Leadership positions in any organization, especially those as diverse as the student government in a modern university, would also to attract the students able and willing to consider multiple perspectives and consider them equally to their own. Students in the early Perry positions are by definition unable to function effectively and independently in this way. Because of this, participation in these areas of the college experience is likely limited to students who are either ready for a shift into the Perry positions characteristic of multiplicity or relativism.

Persistence to the spring semester. Persistence to the spring semester at the target university did not correlate with LEP score, but persistence and attrition issues are

complex and driven by many factors. Intellectual development is only one of these. The lack of correlation may simply reflect the matriculating students' acknowledgement that they would face academic challenges and the decision to work through the challenges.

The milieu of joint enrollment. The milieu of the joint enrollment classes was not a source of significant difference in the LEP scores of students exposed to these classes. The assumption driving this hypothesis is described in the Limitations section, below. Also, the earlier cautions about the low power of the advanced placement students must be considered in evaluating the results.

An optimistic reading of this finding lends support to the argument that the joint enrollment teachers in the high school prepare students as effectively as the college faculty and adjuncts hired to staff the same joint enrollment classes. Based on this reading, the *ad hoc*, scalability, revenue, and convenience basis of decisions about the location of joint enrollment classes and their staffing become less academically suspect. This finding also appears to lend credibility to the claim that the greater depth of subject matter preparation of the college faculty may be effectively counter-balanced by the greater pedagogical training of the high school teachers, especially in the cases where the high school teachers are required to possess a master's degree or be otherwise qualified to teach at the community college level prior to accepting assignment in a joint enrollment classroom. In large universities, the same classes typically transferred as joint enrollment classes are taught by teaching or graduate assistants. These teaching or graduate assistants in many cases have immediately graduated from a baccalaureate program and may or may not have pedagogical training prior to beginning their teaching duties.

The optimistic reading also calls into question protestations that the more consistent interruptions on the high school campus and the lack of immediate access to the college-level support services poses a potential risk to the preparation of joint enrollment students. A student in a study by Uhlenkamp and Glenn (2010) stated that her joint enrollment at the high school level provided a great deal of academic and social support, to the point that she thought it might be excessive. It is possible that what felt like too much support might have been an entirely appropriate amount.

The assumptions forced by the data from the target university indicated that community colleges provided 406 of the 648 joint enrollment credit hours in the sample. These were assumed to be in the high school milieu, staffed by high school instructors. These familiar surroundings may have worked against the establishment of the intellectual pressure needed to prepare the participants to expend the intellectual and emotional energy required to make a shift to a higher intellectual development position.

However, a more pessimistic reading is also viable. This finding, that milieu does not correlate with higher LEP scores, appears to confirm the fears and claims of the university panelists in the Iowa Education Summit (Iowa Department of Education, 2011), who stated that the students in many joint enrollment classes were ill-prepared for the upper division work in which their transferred credit placed them. Indeed, this finding expands the concern to include advanced placement, since these two programs were not found to effect significant differences in intellectual development over regular high school programming. If the joint enrollment-only and advanced placement-only students are not significantly advanced over their regular program peers, this should call into question the motivations for continuing these programs as they are currently executed.

Suggestions for reform of these programs will follow in the Conclusions or Implications sections.

One of the advantages of the high school milieu is that the students are ensconced within their communities. That advantage also hides a disadvantage: the faculty who teach those classes are also ensconced in that community, and without the academic freedom guaranteed to college instructors, they may be less likely to take on controversial issues or to address them in ways that are characteristic of the academy, due to fears of offending community values (Kurfiss, 1988). King and Kitchner (1994) indicated that this exploration of controversial issues form an important part of the academic pressure that students respond to when moving from one intellectual development position to another. Failing to address these ethical and moral issues may account for the finding of a lack of development in the milieus.

The definition and assessment of critical thinking complicates attempts to teach in a way that will lead to the desired shifts. High school faculty may not only feel confusion about or misunderstand the concept of critical thinking: some believe that this is not a part of the job they were hired to do.

High school GPA. That high school GPA is not correlated with the LEP is not unexpected, since college-bound high school students frequently learn how to “play the game” of school. As Johns (1993) put it, the matriculating students arrive at college having learned to play pretty good games of checkers at the high school level. The lack of correlation between LEP score and high school GPA may indicate that the high school expectations allow students to remain in Perry (1970) position two, which characterizes a student who relies on the existence of an absolute truth, a single correct answer. Even the

students exposed to both advanced placement and joint enrollment programs scored an LEP mean of only 354.33, placing them in the early stages of movement toward position 4. This finding confirms the findings of the studies that Clinchy, Lief, and Young (1977) reported. Perry described two forms in positions two and three, which he termed adherence and opposition.

High school students in adherence are those who play Johns' (1993) checkers game well and earn high grades. These students, when face with a teacher who tries to get them to take different perspectives, frequently believe that the exercise is merely an attempt to help them sharpen their argumentative skills in preparation for the debates against incorrect views in which they must inevitably engage. The students in opposition rebel against authority and frequently earn lower grades. These students are typically not incapable of playing the school game, since many see dramatic differences between their high school and college GPAs. Perry (1970) made clear that adherence and opposition were equally valid reactions to the shifts in intellectual development position.

The finding that the joint enrollment cohort earned a mean high school GPA 3.2 indicates that the target population of credit-based transfer programs has in fact changed from the beginnings of these programs. At inception, credit-based transfer programs were viewed as obvious acceleration programs for gifted or talented high school students. These programs are now admitting a wider range of students, which may be a continuation of the college access trends of the last forty years. A student in the joint enrollment cohort earned a 2.01 high school GPA. While that GPA would not exclude the student from possibly belonging in the ranks of gifted and talented high school students, it would indicate that the student likely exhibits behaviors precluding high

achievement in higher education. Again, this finding merits greater study as the call in the political and employment arenas calls for greater and greater access to post-secondary education.

College GPA. The fall semester, first-year college GPAs of students with exposure to credit-based transfer programs should be higher than those without such exposure, if these programs provide anticipatory socialization as claimed. That this does not correlate with LEP calls this socialization into question, reinforcing the concerns of the university presidents at the relative effectiveness of credit-based transfer programs (Iowa Department of Education, 2011). The LEP score and fall semester, first-year GPA were not predictive of each other. If success in college is indicated by GPA, as is commonly accepted, then credit-based transfer programs may not provide the anticipatory socialization function claimed by supporters. The skeptics of credit-based transfer programs, especially joint enrollment, state that the joint enrollment classes on the high school campus cannot provide an accurate socialization experience, and this finding, while not conclusive, does lend some credence to their claims.

The fact that the sample includes some participants with low LEP scores and good GPAs in both high school and college may be accounted for by the existence of maladaptive behaviors: they are able to continue playing the checkers game of high school classes despite the fact that the faculty may be asking them to play the chess game of college. As Perry (1970) pointed out, the shift from one position to another will consume significant mental and emotional energy, and it is natural for students to attempt to conserve that energy and preserve their existing epistemology. The lack of correlation

with GPAs calls into question some of the basic claims about credit-based transfer programs put forth by these programs' supporters.

ACT and SAT scores. That the ACT and SAT scores did not correlate with the LEP scores was not surprising, since these exams are constructed with definite correct and incorrect answers. This construction would play to the strengths of the students in Perry positions two and three. Also, these tests are designed to predict the likely college GPAs of the students, not their intellectual development.

Limitations

This study did not examine whether or not the joint enrollment students maintained that academic momentum, or if they planned to acquire an additional major or minor as a result of their joint enrollment experiences. Some of the joint enrollment classes were classified as developmental by the target university. A scan of the database found that many of these students had scored low on the LEP, a fact that may have led to skewed results for the many of the hypotheses.

A possible selection effect may have influenced the groups, especially the group exposed to both advanced placement and joint enrollment. The results for this group may be influenced as much by family background and motivation as by the coursework and expectations of the credit-based transfer programs.

Students were placed in their cohorts based on their transcript data, and this may have resulted in some inadvertent and unavoidable conflicts in the data, in particular with respect to the advanced placement cohort. Some students enroll in advanced placement classes, but elect not to sit for the advanced placement exams. Conversely, enrollment in an advanced placement class is not a prerequisite for sitting for the advanced placement

exam. The primary researcher has no way to determine how many, if any, students fell into these groups.

The primary investigator has served as a reader for the English Language and Composition advanced placement exam for five years. Each year the primary investigator has encountered some essays that rather than addressing the prompt, report that they have been required by their school districts or families to enroll in the advanced placement class and sit for the advanced placement exam, despite their wishes to remain in the regular high school program. This negative motivation regarding the advanced placement class and test may serve to reduce or negate the effectiveness of this academic program.

The demographic and transcript data did not specify the milieu of the joint enrollment classes. This fact forced the assumption that the classes provided by community colleges were provided in the high school campus by qualified high school teachers, and that classes provided by four year institutions were provided on the college's campus by college faculty.

Implications

The findings of this study demonstrate that simply earning college credit does not necessarily mean that the students have achieved the intellectual development that is ostensibly a primary goal of college attendance and college curricula. The sections below detail the implications of these findings in four areas: professional development and support, transition issues, curricular coherence of programming, and control of budget impact.

Professional development and support. The combination of advanced placement and joint enrollment was the only curricular programming that correlated with significantly improved LEP scores. Based on this finding, school districts and colleges should collaborate to develop and maintain such programming, in preference to either of these in isolation. If the development of a combined program is not possible, the preference would appear to lie with developing and executing quality advanced placement programs. The key to success in these programs is providing the students with sufficient academic pressure to encourage them to shift their intellectual positions. It appears that this combination is the most effective approach. In conjunction with this academic pressure, the faculty of these programs must also receive specific professional development regarding the goal of increasing intellectual development, the role of critical thinking, and why these are important to their student success in college and beyond.

The efforts by NACEP, community colleges, and other organizations to monitor and improve the joint enrollment programs will become even more important. It is clear to even a casual observer that joint enrollment is not going to spontaneously end, given the apparent, if largely unstudied, motivations that encourage the expansion of such programs. The political battle that this would take is too hazardous, and the benefits too intangible. With this reality, the reform referred to above is clearly needed.

Another political battle that professional developers working with credit-based transfer programs need to face is that of standardized testing. The curricular monitoring that should accompany these programs should focus on the teaching of critical thinking that has been shown to lead to shifts in intellectual develop positions. This will require the focus to shift from test preparation to more controversial issues in civil society. This

will require professional, social, and political support for the faculty by the institutions involved in credit-based transfer programs.

Since an accepted goal of credit-based transfer programs is to accelerate students and enhance the rigor of high school curricula, and since the milieu was not a significant source of difference among the cohorts' LEP scores, administrators of credit-based transfer programs should examine the best approaches to professional development. This professional development could aim to increase the effective teaching of critical thinking, which means that the stakeholders of credit-based transfer programs must reach consensus regarding the definition and assessment methods for critical thinking.

Transition issues. One of the major goals of these programs is to ease the transition to college by providing the students with anticipatory socialization. The rejection of the hypotheses examining the programs in isolation and the lack of correlation with college GPA or increased persistence from fall to spring indicate that this socialization may fail. Far from easing the transition from high school to college, it is possible that these programs may complicate the issue by placing the students in classes without a peer group also going through the transitions. While this finding is far from definitive, it still should give stakeholders pause and encourage them to re-examine the support systems in place.

The students for whom credit-based transfer programs were originally designed may not have needed the academic and social support systems and services at a high level, but as a programs expand access to and the number of credit hours earned, the need for such support will increase. Students coming in as a result of this program expansion are more diverse in every way: economically, academically, ethnically, linguistically.

This fact will require effective support from the student life arm of the all involved institutions. This support is not limited to institutions directly involved in credit-based transfer program: the high school and the community college. The colleges that receive these accelerated students must develop policies to aid their transfer matriculates in making a successful transition. These policies can include intrusive advising and counseling for the students who transfer credits sufficient to place in a sophomore or junior status upon their arrival at their first full-time residential college experience. This is an issue that most colleges are only now beginning to consider, let alone develop policies for.

The support systems in the high school should support the students academically, obviously, but the goal should not be to remove all the seams of the transition between high school and college classes. Students should definitely see a difference in expectations, pacing, and intent between the classes they take in the regular programs and those of the credit-based transfer programs. While these greater expectations are undoubtedly a feature of most such programs, it is also the case that some students in these programs see a great deal of support from their teachers in the high school, and they find that when the same level and intrusiveness of support is not available in the college setting, they may encounter additional stresses and transition issues.

To help control this issue, the granting institutions should maintain close control of the curriculum of credit-based transfer programs, especially those taught in high school milieu. The drive to increase access to programs across ability levels and demographics makes this a more critical feature. Also the increasing number of credit hours earned by high school students in these programs means that colleges have less

control over the quality of that preparation. The curricular control and governance should strive to guarantee that appropriate levels of academic pressure are placed on the students during these programs.

The granting institutions may want to consider the inception of a first-year experience style class as a required first joint enrollment class. A class of this nature would serve as a introduction to college in terms of the expectations and different teaching methods that they should expect to meet in the college classroom. It could also serve as an effective piece of professional development for the faculty, who were asked to teach the following joint enrollment classes. Instituting this as a prerequisite for taking additional classes from the institution could help to increase the effectiveness of anticipatory socialization, and better prepare the students for the more intensive coursework that should follow. A useful feature of the first-year experience class and a joint enrollment program could focus on the importance of the liberal arts in a federal republic and the need for a coherent program of a general education. This could help to remove the attitude that general education classes are to be “gotten out of the way” and prepare the students better to see the intimate connection between the various disciplinary areas.

This curricular control and innovations such as the first-year experience classes for joint enrollment students would also help to address the conflict between admissions criteria at four-year institutions and more open access issues that are driving the expansion of credit-based transfer programs. The concern is that students who do not meet standard admissions criteria will enroll in the community college and earn sufficient grades to transfer credit into the four-year institution, despite having potentially large

gaps in their academic preparation and skills. A class focused on the habits and attitudes desired of the college student may help to remove this concern if the coursework associated with this class could be specifically aimed at inculcating in the students the intellectual life expected in a university.

Curricular coherence of programming. The joint enrollment programs in isolation do not appear more effective in helping high school students to transition to more complex intellectual development positions than regular high school programs. The expansion of joint enrollment programs to increase the rigor of the high school programs may have the unintended effect of reducing the quality of college-credit class work. To prevent this, the granting institutions, or by other organizations with the power to accredit such programs must manage and effectively monitor the joint enrollment curricula. The mechanisms to do this are being built. The pressure to prevent excessive course failures in these expanding programs may lead to the conscious or unconscious decision to lower standards, to the long-term detriment of the participating students, and to the loss of credibility for the programs themselves.

The only covariate that was found to correlate with increased LEP scores was participation in the fine arts and student government. It is an old saw that arts and government leadership helps students to improve their critical thinking and to apply academic learning to actual problems. However, the fact that this has been said before does not reduce the persuasiveness of the finding that colleges and high schools should encourage participation in the arts and leadership opportunities through whatever means possible. While this encouragement would not require participation in credit-based transfer programs, attention to the connections that the liberal arts and general education

classes can provide are a potentially effective avenue for encouraging such development through participation. Some may argue that this comes late in a high school career, which is true. However, it may set the stage for a more robust participation upon matriculation to the college environment, a time when according to most research, the students are more prepared and likely to expend the energy needed for shifts in intellectual position.

The partnerships and dialogue between colleges and high schools that work to ensure quality credit-based transfer programs can bring may also lead to increased curricular articulation between these sectors of American education. Decades of writers have discussed the idea that colleges do not know what the high schools teach, and that the high schools do not know what the colleges expect the students to be able to do when they arrive in the fall. This dialogue would be a natural process of the effort to ensure quality in the credit-based transfer programs.

Control of budget impact. If the findings of this study are taken as definitive, the stakeholders for credit-based transfer programs need to think carefully about how, where, and why these programs are put into place and operation. Institutions in the state of Iowa in 2011 granted the equivalent of over \$42 million of college credit to joint enrollment students. It is true that this amount does not represent the cash transfer of the programs: part of it is actual money, and the remainder is lost revenue to the granting institutions, which in Iowa are almost exclusively community colleges. If the programs in isolation are ineffective in moving students to the levels of intellectual development desired by higher education and the post-graduation job market, then thoughtful and intentional reform are required to make the costs of the programs a worthy public investment.

While the results of this test revealed no significant differences for the different milieu, it seems important to note that the institutions involved in offering joint enrollment classes should find political conditions that hold their budgets harmless. This should help to ensure that academic concerns come before budgetary concerns. If further studies find that the college milieu is superior, then the credit-based transfer programs should move to the college campus.

The finding that credit-based transition programs were correlated with lower enrollment in developmental classes also has budget implications. If colleges support the institution and maintenance of quality credit-based transfer programs, it is possible that the number of students placed into developmental classes at the college level will be reduced. This would have several positive effects: the number of sections required for developmental education may be reduced, the students may find themselves on a more timely path to graduation, and persistence may increase, based on the fact that placement into developmental education has been implicated in increasing the attrition rate, especially among first- and second-year students at college.

Coupling these budget implications with the need to maintain curricular coherence and pay attention to transition issues, it is even more important that institutions and organizations work to maintain and increase the quality of credit-based transfer programs. These can be developed into programs that launch the students onto successful academic paths in college and then into the job market. Not only would this benefit students, it would enable the institutions to offer more classes at the same cost or possibly even reduce the cost, which would be a welcome response to the concerns about tuition that have been raised in recent years.

Recommendations for Further Research

Several directions for future study appear clear to the primary researcher. Some possible studies take a longitudinal sample, while others would expand the sample to include matriculates from peer institutions. A multi-year longitudinal study focusing on matriculates and based on the current study would help to confirm the current findings, especially as regards the advanced placement cohort, which has a low power in the current study.

A repeat of the study with a longitudinal sample, controlled for selection bias by examining student socio-economic status, parental education, and milieu of the credit-based transfer program may yield more reliable data. The current study has begun the parsing of the joint enrollment data that should continue. The longitudinal possibilities below should also control for these variables.

A longitudinal study using the same cohort through their careers at the target institution could administer the LEP several times during their careers: in the fall and spring of the first year and the end of the second, third, fourth, and fifth year, if applicable. Such a study would examine if the credit-based transition program students exhibit an advantage in intellectual development, if they maintain this advantage, or how much time elapses before the regular program students achieve similar LEP scores. A qualitative component or alternative might examine the effect of the credit-based transfer program exposure on the shift in intellectual development. An alternative study could also include data from peer colleges in the Midwest, which should yield cohorts of a sufficient power to confirm or refute the current study's findings.

Other directions of potentially profitable investigation include qualitative examinations of the transitional experiences of students with a high frequency of exposure to credit-based transfer programs to determine if a reduced peer group in their first semester classes correlate with any disadvantages in transition to the college environment. A more finely nuanced study including qualitative methods may reveal persuasive evidence for a correlation of these motivational goals of joint enrollment: increasing rigor in the high school, spurring student interest in class work, and providing the students with anticipatory socialization, along with college-going aim of increasing intellectual development. An interesting mixed methods study might examine the type and nature of academic and social support in the high school milieu for both advanced placement and joint enrollment. This would include examining the support which the credit-based transfer programs provide to define the extent of the cocooning from which the students benefit.

All of these areas of research would aim to improve and document the results of a fast-growing and relatively unstudied area in American education. These programs hold significant potential to improve or degrade the educational outcomes for thousands of high school students, depending on the policy decisions of the stakeholders.

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Appendix A

Milieu Definitions

Milieu Definitions

1. HH- high school campus, high school teacher
2. HCF- high school campus, full time college teacher
3. HCA- high school campus, adjunct college teacher
4. CC- college campus, full time college teacher
5. CA- college campus, adjunct college teacher
6. AC- alternate campus, full time college teacher
7. AA- alternate campus, adjunct college teacher
8. OHH- online, high school supervision, high school teacher
9. OHC- online, high school supervision, full time college teacher
10. OHA- online, high school supervision, adjunct college teacher
11. ONH- online, no supervision, high school teacher
12. ONC- online, no supervision, full time college teacher
13. ONA- online, no supervision, adjunct college teacher

Appendix B

Learning Environment Preferences

LEARNING ENVIRONMENT PREFERENCES

This survey asks you to describe what you believe to be the most significant issues in your **IDEAL LEARNING ENVIRONMENT**. Your opinions are important to us as we study how students think about teaching and learning issues. We ask, therefore, that you take this task seriously and give your responses some thought. We appreciate your cooperation in sharing what you find most important in a learning environment.

The survey consists of five sections, each representing a different aspect of learning environments. In each section, you are presented with a list of specific statements about that particular area. Try not to focus on a specific class or classes as you think about these items; focus on their significance in an *ideal* learning environment *for you*.

We ask that you do two things for each section of the instrument:

1. Please **rate** each item of the section (using the 1-4 scale provided below) in terms of its significance or importance to your learning.
2. Review the list for your top-rated items (those you rated 4, or 3 if you have no items rated 4) and **rank** the three most important items to you as you think about your *ideal learning environment* by writing *the item numbers* on the appropriate spaces at the bottom of the answer sheet.

Please mark your answers on the separate answer sheet provided, and be sure to indicate both your ratings of individual items **and** *your ranking of the top 3 items in each section*. It is very important that you indicate your top three choices for each question area by writing the ITEM NUMBER in the spaces provided (1st choice, 2nd choice, 3rd choice).

Rating Scale:

1	2	3	4
Not at all significant	Somewhat significant	Moderately significant	Very significant

Before you begin, you may be asked to provide us with some background information. This information will be used to examine group differences; your name or social security number may be used at some point in the future if a follow-up survey is required. **ALL RESPONSES WILL BE KEPT CONFIDENTIAL**. Again, thank you very much for sharing with us your ideas about learning.

**DOMAIN ONE:
COURSE CONTENT/VIEW OF LEARNING**

MY IDEAL LEARNING ENVIRONMENT WOULD:

1. Emphasize basic facts and definitions.
2. Focus more on having the right answers than on discussing methods or how to solve problems.
3. Insure that I get all the course knowledge from the professor.
4. Provide me with an opportunity to learn methods and solve problems.
5. Allow me a chance to think and reason, applying facts to support my opinions.
6. Emphasize learning simply for the sake of learning or gaining new expertise.
7. Let me decide for myself whether issues discussed in class are right or wrong, based on my own interpretations and ideas.
8. Stress the practical applications of the material.
9. Focus on the socio-psycho, cultural and historical implications and ramifications of the subject matter.
10. Serve primarily as a catalyst for research and learning on my own, integrating the knowledge gained into my thinking.
11. Stress learning and thinking on my own, not being spoonfed learning by the instructor.
12. Provide me with appropriate learning situations for thinking about and seeking personal truths.
13. Emphasize a good positive relationship among the students and between the students and teacher.

PLEASE BE SURE TO REVIEW THE ABOVE LIST AND MARK YOUR THREE MOST SIGNIFICANT ITEMS (BY ITEM NUMBER) IN THE LINES PROVIDED ON THE ANSWER SHEET.

Rating Scale:

1	2	3	4
Not at all significant	Somewhat significant	Moderately significant	Very significant

DOMAIN TWO: ROLE OF INSTRUCTOR

IN MY IDEAL LEARNING ENVIRONMENT, THE TEACHER WOULD:

1. Teach me all the facts and information I am supposed to learn.
2. Use up-to-date textbooks and materials and teach from them, not ignore them.
3. Give clear directions and guidance for all course activities and assignments.
4. Have only a minimal role in the class, turning much of the control of course content and class discussions over to the students.
5. Be not just an instructor, but more an explainer, entertainer and friend.
6. Recognize that learning is mutual--individual class members contribute fully to the teaching and learning in the class.
7. Provide a model for conceptualizing living and learning rather than solving problems.
8. Utilize his/her expertise to provide me with a critique of my work.
9. Demonstrate a way to think about the subject matter and then help me explore the issues and come to my own conclusions.
10. Offer extensive comments and reactions about my performance in class (papers, exams, etc.).
11. Challenge students to present their own ideas, argue with positions taken, and demand evidence for their beliefs.
12. Put a lot of effort into the class, making it interesting and worthwhile.
13. Present arguments on course issues based on his/her expertise to stimulate active debate among class members.

PLEASE BE SURE TO REVIEW THE ABOVE LIST AND MARK YOUR THREE MOST SIGNIFICANT ITEMS (BY ITEM NUMBER) IN THE LINES PROVIDED ON THE ANSWER SHEET.

Rating Scale:

1	2	3	4
Not at all significant	Somewhat significant	Moderately significant	Very significant

DOMAIN THREE: ROLE OF STUDENT/PEERS

IN MY IDEAL LEARNING ENVIRONMENT, AS A STUDENT I WOULD:

1. Study and memorize the subject matter--the teacher is there to teach it.
2. Take good notes on what's presented in class and reproduce that information on the tests.
3. Enjoy having my friends in the class, but other than that classmates don't add much to what I would get from a class.
4. Hope to develop my ability to reason and judge based on standards defined by the subject.
5. Prefer to do independent research allowing me to produce my own ideas and arguments.
6. Expect to be challenged to work hard in the class.
7. Prefer that my classmates be concerned with increasing their awareness of themselves to others in relation to the world.
8. Anticipate that my classmates would contribute significantly to the course learning through their own expertise in the content.
9. Want opportunities to think on my own, making connections between the issues discussed in class and other areas I'm studying.
10. Take some leadership, along with my classmates, in deciding how the class will be run.
11. Participate actively with my peers in class discussions and ask as many questions as necessary to fully understand the topic.
12. Expect to take learning seriously and be personally motivated to learn the subject.
13. Want to learn methods and procedures related to the subject--learn how to learn.

PLEASE BE SURE TO REVIEW THE ABOVE LIST AND MARK YOUR THREE MOST SIGNIFICANT ITEMS (BY ITEM NUMBER) IN THE LINES PROVIDED ON THE ANSWER SHEET.

Rating Scale:

1	2	3	4
Not at all significant	Somewhat significant	Moderately significant	Very significant

DOMAIN FOUR: CLASSROOM ATMOSPHERE/ACTIVITIES

IN MY IDEAL LEARNING ENVIRONMENT, THE CLASSROOM ATMOSPHERE AND ACTIVITIES WOULD:

1. Be organized and well-structured--there should be clear expectations set (like a structured syllabus that's followed).
2. Consist of lectures (with a chance to ask questions) because I can get all the facts I need to know more efficiently that way.
3. Include specific, detailed instructions for all activities and assignments.
4. Focus on step-by-step procedures so that if you did the procedure correctly each time, your answer would be correct.
5. Provide opportunities for me to pull together connections among various subject areas and then construct an adequate argument.
6. Be only loosely structured, with the students themselves taking most of the responsibility for what structure there is.
7. Include research papers, since they demand that I consult sources and then offer my own interpretation and thinking.
8. Have enough variety in content areas and learning experiences to keep me interested.
9. Be practiced and internalized but be balanced by group experimentation, intuition, comprehension, and imagination.
10. Consist of a seminar format, providing an exchange of ideas so that I can critique my own perspectives on the subject matter.
11. Emphasize discussions of personal answers based on relevant evidence rather than just right and wrong answers.
12. Be an intellectual dialogue and debate among a small group of peers motivated to learn for the sake of learning.
13. Include lots of projects and assignments with practical, everyday applications.

PLEASE BE SURE TO REVIEW THE ABOVE LIST AND MARK YOUR THREE MOST SIGNIFICANT ITEMS (BY ITEM NUMBER) IN THE LINES PROVIDED ON THE ANSWER SHEET.

Rating Scale:

1	2	3	4
Not at all significant	Somewhat significant	Moderately significant	Very significant

DOMAIN FIVE: EVALUATION PROCEDURES

EVALUATION PROCEDURES IN MY IDEAL LEARNING ENVIRONMENT WOULD:

1. Include straightforward, not "tricky," tests, covering only what has been taught and nothing else.
2. Be up to the teacher, since s/he knows the material best.
3. Consist of objective-style tests because they have clear-cut right or wrong answers.
4. Be based on how much students have improved in the class and on how hard they have worked in class.
5. Provide an opportunity for me to judge my own work along with the teacher and learn from the critique at the same time.
6. Not include grades, since there aren't really any objective standards teachers can use to evaluate students' thinking.
7. Include grading by a prearranged point system (homework, participation, tests, etc.), since I think it seems the most fair.
8. Represent a synthesis of internal and external opportunities for judgment and learning enhancing the quality of the class.
9. Consist of thoughtful criticism of my work by someone with appropriate expertise.
10. Emphasize essay exams, papers, etc. rather than objective-style tests so that I can show how much I've learned.
11. Allow students to demonstrate that they can think on their own and make connections not made in class.
12. Include judgments of the quality of my oral and written work as a way to enhance my learning in the class.
13. Emphasize independent thinking by each student, but include some focus on the quality of one's arguments and evidence.

PLEASE BE SURE TO REVIEW THE ABOVE LIST AND MARK YOUR THREE MOST SIGNIFICANT ITEMS (BY ITEM NUMBER) IN THE LINES PROVIDED ON THE ANSWER SHEET.

Rating Scale:

1	2	3	4
Not at all significant	Somewhat significant	Moderately significant	Very significant

LEARNING ENVIRONMENT PREFERENCES ANSWER SHEET

STUDENT CODE NUMBER: _____

Rating Scale:	4	1	2	3
	4			
	Not at all significant	Somewhat significant	Moderately significant	Very significant

For each domain, record your rating of each item (using the rating scale described above) on the lines by the appropriate item numbers.

DOMAINS

	Course Content/ Classroom View of Learning Atmosphere	Role of Evaluation Instructor Procedures	Role of Student/Peers	
1.	1. _____	1. _____	1. _____	1. _____
	—	—	—	—
2.	2. _____	2. _____	2. _____	2. _____
3.	3. _____	3. _____	3. _____	3. _____
4.	4. _____	4. _____	4. _____	4. _____
5.	5. _____	5. _____	5. _____	5. _____
6.	6. _____	6. _____	6. _____	6. _____
7.	7. _____	7. _____	7. _____	7. _____
8.	8. _____	8. _____	8. _____	8. _____
9.	9. _____	9. _____	9. _____	9. _____
10.	10. _____	10. _____	10. _____	10. _____

11.	11.	11.	11.	11.
_____	_____	_____	_____	_____
12.	12.	12.	12.	12.
_____	_____	_____	_____	_____
13.	13.	13.	13.	13.
_____	_____	_____	_____	_____

Now record your **TOP THREE CHOICES** for each domain area by writing the **ITEM NUMBERS**, not your ratings, of these choices in the spaces provided below. (For example, if you consider item # 2 the most significant issue for your own learning related to the domain of "Role of Instructor," write "2" next to "1st" under that domain below.)

<u>COURSE</u>	<u>CLASSROOM</u>	<u>ROLE OF</u>	<u>ROLE OF</u>	<u>ROLE OF</u>
<u>CONTENT</u>	<u>ATMOSPHERE</u>	<u>INSTRUCTOR</u>	<u>STUDENT/PEERS</u>	<u>PROCEDURES</u>
1ST _____	1ST _____	1ST _____	1ST _____	1ST _____
2ND _____	2ND _____	2ND _____	2ND _____	2ND _____
3RD _____	3RD _____	3RD _____	3RD _____	3RD _____
3RD _____				

Appendix C

CSID Contract

Center for the Study of Intellectual Development
1505 Farwell Ct. NW
Olympia, WA 98502
Dr. William S. Moore, Coordinator
360-786-5094, 360-528-1809 (voice) wsmoore51@comcast.net (email)

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I agree to the following items as conditions for my use of the Measure of Intellectual Development and/or the Learning Environment Preferences:

- 1) I understand that this permission only applies to the research project described herein; I will not release the instruments to others or use the instruments in any subsequent studies without permission from the Center;
- 2) **MID** essays will be scored by CSID raters or raters approved by the Center in order to insure high levels of accuracy and consistency. If approved, outside raters are used, I understand that a percentage of the sample (from 10-25% depending on individual circumstances) must also be rated by CSID for reliability purposes. **LEP** answer sheets will also be sent to CSID for scoring;
- 3) For scoring purposes, I will send the originals or high-quality copies of the **MID** essays (and a cover sheet with student demographic information) or the **LEP** answer sheets, and I understand that these will be retained by CSID for its data bank;
- 4) Upon request, I will provide CSID with a copy of any research report or publication produced based on this data, and will charge the Center for any photocopying costs incurred.

In return, the Center for the Study of Intellectual Development agrees to:

- 1) Rate the **MID** instruments for a fee of \$3.50 per essay for single-rating, \$6.50 per essay for full reconciled ratings (two raters per essay);
- 2) Score the **LEP** answer sheets for a fee of \$1.00 per instrument);
- 3) For the **MID**, provide a summary sheet of both individual and reconciled (if applicable) ratings; for the **LEP**, a summary sheet including all demographic information,

position sub-scores, and the overall CCI (Cognitive Complexity Index) score, plus basic summary statistics as requested by the researcher;

4) Provide any additional follow-up necessary for the interpretation of the instrument scores or summary sheets.

5) SPECIAL NOTES/REVISIONS OF TERMS:

Instrument/s Requested:

MID _____ Indicate preferences: 1) Essay Form/s: A ___ AP ___ Q _____
 Other*? _____

2) Rating options:
 Single-rated? _____
 Double-rated? _____
 Single-rated, with double-rated sub-sample? _____

LEP XX

*Essays A, AP, and Q are the primary essays used for measuring general epistemological issues related to the Perry scheme. Alternative essays are available for research on other specific domains, e.g., careers, decision-making, specific academic disciplines (math, humanities, science). For more information about these essays, or potential work on other variant essays, contact the Center Coordinator.

James J Uhlenkamp
 Name of Principal Researcher



 Signature

University of Nebraska/Graceland University
 Institution

8/2/2011
 Date

1 University Place
 Address

641-784-5077
 Phone (w/ AC)

Lamoni, IA 50854
 City/State/Zip Code

juhlenkamp42@gmail.com
 Email address

 William S. Moore, Coordinator, CSID

 Date

Please attach a brief description of your assessment project: basic purpose, hypotheses, population/s sampled, sample size, and time frame for data collection and analyses.

The *Learning Environment Preferences* (LEP) will be used in two concurrent studies, one being a dissertation and the second being a program assessment for the first year experience program (FYE) at Graceland University. The fall data pool will provide data for the dissertation and for. A second instrument administration for FYE program assessment will occur in the spring semester of 2012.

The dissertation hypothesis is that high school credit-based transfer programs participation does not improve first year student Perry positions as compared to students in a regular high school program. The program assessment hypothesis is that the first year of college, including a three credit mandatory first year experience seminar, does not significantly advance Perry position.

In August, participants will be solicited from the entire Fall 2011 first year student cadre at Graceland University, a private master's institution.

Following the administration and analysis of the quantitative instrument, three students from each cohort will be invited to participate in the follow-up journaling and interviews. The selection criteria, using maximum variation, will include students who lagged, met, and exceeded the average intellectual position for their cohorts. The particular criteria will be refined and finalized following the initial assessment.

The sample size will be approximately 240 students for the LEP and 12 for the interviews and journals.

The first data collection will occur at the beginning of the fall 2011 semester. The second data collection will occur in the last three weeks of the spring semester. The students who failed to complete the second semester will be considered as a separate cohort. Variables may include first year GPA, hours attempted, hours completed, intercollegiate athletics participation and participation in student affairs groups and activities.

Appendix D

Institutional Review Board Approval



June 15, 2012

James Uhlenkamp
Department of Educational Administration

Donald Uerling
Department of Educational Administration
134 TEAC, UNL, 68588-0360

IRB Number:
Project ID: 12012
Project Title: Do credit based transition programs have an impact on intellectual development?

Dear James:

The Institutional Review Board for the Protection of Human Subjects has completed its review of the Request for Change in Protocol submitted to the IRB.

1. It has been approved to remove the requirement of obtaining informed consent form this project. You will obtain de-identified program data and demographic information from the university's registrar and office of admissions and will not have direct contact with the students for this research.

We wish to remind you that the principal investigator is responsible for reporting to this Board any of the following events within 48 hours of the event:

- * Any serious event (including on-site and off-site adverse events, injuries, side effects, deaths, or other problems) which in the opinion of the local investigator was unanticipated, involved risk to subjects or others, and was possibly related to the research procedures;
- * Any serious accidental or unintentional change to the IRB-approved protocol that involves risk or has the potential to recur;
- * Any publication in the literature, safety monitoring report, interim result or other finding that indicates an unexpected change to the risk/benefit ratio of the research;
- * Any breach in confidentiality or compromise in data privacy related to the subject or others; or
- * Any complaint of a subject that indicates an unanticipated risk or that cannot be resolved by the research staff.

This letter constitutes official notification of the approval of the protocol change. You are therefore authorized to implement this change accordingly.

If you have any questions, please contact the IRB office at 472-6965.

Sincerely,

Becky R. Freeman, CIP
for the IRB

