Cognitive Development of Adult Undergraduate Students: Cohort and Non-Cohort Settings

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In response to the increased number of adults in the student population, colleges and universities began offering courses in a variety of formats to accommodate the working adult's schedule.[1] These formats include, but are not limited to, intensive weekend courses and accelerated cohort programs. While traditional students have been studied to ascertain how college affects them intellectually,[2] research is needed to address the impact of the college experience on the adult student.[3] Magolda reported that "understanding college students' intellectual development is at the heart of effective educational practice."[4]

Over the years, college administrators and faculty have been looking at ways to understand how traditional college students develop and learn,[5] and how adult students learn.[6] Pascarella and Terenzini in their book, *How College Affects Students*, presented an overview of the major developmental theories and research.[7] One aspect of college learning examined is the development of cognitive competencies--not just what is learned in the content areas, but the thinking skills developed as a result of being a participant in the college education process. Pascarella and Terenzini stated:

> These cognitive competencies and skills represent the general intellectual outcomes of college that permit individuals to process and utilize new information; communicate effectively; reason objectively and draw objective conclusions from various types of data; evaluate new ideas and techniques efficiently; become more objective about beliefs, attitudes, and values; evaluate arguments and claims critically; and make reasonable decisions in the face of imperfect information.[8]

The question for college educators is: Do adult students in non-traditional formats develop cognitive complexity? This phenomenological study explored if and how adult undergraduate students increase cognitive complexity using Perry's scheme[9] in two different educational delivery systems, an intensive non-cohort model and an accelerated cohort model.

Intellectual Development

As a result of his research on cognitive complexity, Perry stated that people organize meanings out of their experiences.[10] Cognitive complexity is the ability to think in more complex ways moving from a dualistic, objective view to a multiplicity, subjective view, to a more relativistic, constructivist perspective. Hofer and Pintrich maintained that this development is "...the evolution of individual's thinking structures and meaning-making toward greater and more adaptive complexity."[11] According to Moore, Perry's work "underscores the notion that the most powerful learning, the learning most faculty really want to see students achieve as a result of their college experiences, involves significant qualitative changes in the learners themselves."[12]

Perry first published his scheme in 1970 after completing a longitudinal study of college students 1954-1963.[13] His study on the abstracts of knowing and valuing demonstrated the possibility of assessing developmental positions. Nine positions were developed from his extensive interviews of students whom he followed from their freshman year at college through their senior year. He chose the word *position* to stress the lack of a specified duration. The focus of each position is on the person's point of view at that time. To move from one position to another takes motivation to reorganize major personal investments. Each position includes and transcends the previous one and should be seen as development rather than change. The capitalizations seen in the following description of each position are a part of Perry's explanation. Since only the first 5 Positions deal with intellectual development, this study will examine only these positions.

Perry's Position 1, "Basic Duality", is a time when a person sees the world in polar terms: we-right-good vs. other-wrong-bad. The person holds the belief that "Right Answers" exist for everything in the "Absolute" and are known to "Authorities" whose responsibility is to teach them. During this period, there is no objectivity, and there is one right answer to all questions. The way to solve problems is through adherence, obedience, or conformity to the "Right" and what "They" want. A manifestation of this position is a student reading all assigned readings word by word. According to Perry, all individuals possess the cognitive complexity of Position 1. Transition from Position 1 to Position 2 often comes from a challenge from peers. Diversity experienced with peers and within the classroom causes students to question if differences of opinion can exist in the "Absolute".[14]

Position 2, "Multiplicity Pre-Legitimate", is a time when students are able to perceive diversity of opinion and uncertainty. However, they account for these as unnecessary confusion in poorly qualified "Authorities" or as mere hoops set by the "Authorities" in order for students to find the answer for themselves. The student usually aligns himself or herself in "Opposition to the Authority". There is still the overriding expectation that one answer must be right. Although the "Authority" and "Absolutes" are still assumed to be readily available, the student must seek them out. During this position of development, among the confusion there is some grappling with uncertainty and complexity, which assists students in moving to Position 3. Transition from Position 2 to Position 3 is prompted by students realizing that "Authorities" admittedly do not have all the right answers.

"Multiplicity Subordinate", Position 3, is a time when diversity and uncertainty are accepted as legitimate, but temporary, in that the right answer has just not been found yet. Uncertainty and complexity are not looked upon as just exercises imposed upon students, but as realities in their own right. Multiplicity gives the person permission to form his or her own opinion. Students during this stage seek out the parameters in which their opinion will be graded. Students may

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feel in conflict with the fact that there is a spread of uncertainty and diversity among "Authorities"; yet they will be assigned a grade under this uncertainty. Transition from Position 3 to Position 4 takes place when the tie between "Authority" and "Absolute" is loosened. During this transition, students realize that uncertainty is unavoidable. Students have not distinguished between legitimate abstract thought and "bull". A student's attitude toward "Authority" is crucial at this point. If a student is resentful of the "Authority" (Oppositional), then he or she may "Escape" or "Retreat". "Escape" as defined by Perry is abandonment of responsibility or alienation.[15] "Retreat" is to stay in the simplest form of dualism and avoid complexity and ambivalence. In contrast, students who trust in "Authorities" (Adherence) move forward, but along a different path.

In Position 4, "Multiplicity Correlates" or "Relativism Subordinate", development splits into two groups based on the student's tendency toward "Opposition" or "Adherence".[16] Both development sequences are considered equivalent. In "Multiplicity Correlates" (4a), the student takes the path of "Opposition". The perception is that legitimate uncertainty is extensive. As long as there is ambiguity, the student has the right to his or her own opinion, and "They" will have no right to call it wrong. An opinion, however, is not related to evidence, experience, expert judgment, or purpose, but to the person who holds it. All that cannot be proven "Wrong" is "Right". Thus, this structure is still dualistic. In "Relativism Subordinate" (4b), the "Adherence" students are more trusting and follow a much smoother path. The student assimilates, under the guidance of the "Authority", that there is uncertainty, ambiguity, and differences of opinion in the world. The awareness that there is more than one approach to a problem causes the individual to start the process of metacognition, thinking about thinking. Answers are no longer viewed as right or wrong, but evaluated in terms of good or bad. In Perry's study, Position 4 was where most of the freshmen students concluded their first year of college. Transition from Position 4a to Position 5 was very difficult for these students. Transition from Position 4b to Position 5 was a move from *what they want* to *the way they want us to think*. Reasoning provides the lever to move knowledge from dualistic to the qualitative. Some answers may be more legitimate than others. Theories move from truth to models or metaphors which approximate the order of observed data or experience.

During "Relativism Correlate, Competing, or Diffuse", Position 5, the student perceives all knowledge and values as contextual and relativistic. During this position, students can "...spot a false dichotomy, talk about assumptions and frames of reference, and argue about the degree of coherence of interpretation or their congruence with data."[17] Relativism is perceived as the common characteristic of all thought and relationships. Students are quite taken with this new skill and use it in exploring alternative perspectives in all areas of life. This transformation in development seems to occur on an unconscious level. Students just habitually begin to perceive that such thinking is appropriate.

The most recognized instrument to measure Perry's Positions[18] is the Learning Environment Preferences (LEP), which numerous higher education institutions have used in research.[19] The Learning Environment Preferences (LEP) is an instrument developed by William Moore, consisting of 65 items across five domains: (1) view of knowledge/learning; (2) role of the instructor; (3) role of the student/peers; (4) classroom atmosphere and activities; and (5) role of evaluation/grading.[20] According to Moore, "These domains focus on student preferences for specific aspects of the classroom learning environment shown to be associated with increasing complexity on the Perry scheme of intellectual development."[21]

Overview of the Study

This study was an effort to capture the experiences influencing the possible cognitive development of adult undergraduate students who are experiencing two different educational formats. There was no attempt to compare these experiences, but rather to understand each. The quantitative component involved a pretest and posttest comparison, using the LEP, to determine if an increase in cognitive development occurred. This instrument was administered within the first three weeks of the students' beginning classes and within three weeks of the conclusion of the study period. Additionally, the difference between the pretest and posttest scores determined who would be interviewed.

The qualitative methods used by the researcher included classroom observations over a semester and student interviews at the conclusion of the experience. The 23 observations spanned the length of the research period. The researcher and co-rater described the student arrangement, setting, classroom environment, social environment (interactions between students before class and during breaks), the instructor's communication style and engagement with students, and the interaction during the class session. The interactions were rated based on the "Steps for Better Thinking" rubric developed by Lynch, Wolcott, and Huber from Perry's Positions.[22] All observations encompassed the entire class session, which ranged from one to four hours. The observations gave the researcher the opportunity to learn about the students' classroom environment and record the interactions.

Two universities were purposefully selected because they offered college courses at the general education level (freshman and sophomore level) and allowed adult students, who had never attended college previously, to begin these programs. They also offered programs in the same geographical area but delivered the educational experience using different formats. The semester experience at both institutions included the students in the first and second year program who were taking general education requirements.

University A provided adult students with a non-cohort format similar in length to a traditional semester. Intensive classes conducted for 16 weeks met in the evenings or Saturdays. One course met one hour a week (16 contact hours per semester) supplemented by videotapes and other assignments. The second type of course met once a week for three hours (48 contact hours per semester). The third type of course met four hours every other Saturday (32 contact hours per semester). All three types of courses earned four credit hours each. Students selected courses based upon their educational needs. At University A, because the students could choose the courses they wanted, the students in the study participated in a variety of four-credit courses: Sociological Imagination, English Composition, Computer Information Systems, Aesthetics in Art, Issues in American Politics, Aesthetics in Music, Discovering Psychology, Introduction to Business, or Introduction to Speech. Part-time instructors taught all courses. The researcher visited eight courses in order to gain a sample of 16 students meeting the criterion.

University B offered an accelerated cohort adult program with a lock-step design where students completed a three credit course every five weeks. The students participated in one course at a time. Class sessions occurred from 6:00 p.m. to 10:00 p.m. one night a week. In the first course of the program, students selected study

groups of four or five students who would work together on a weekly basis to complete learning assignments outside of class for a group grade. At University B, the students participated in these three credit courses: Introduction to Business Education; Foundations of Business Management; Written Communication; and Oral Communication. Part-time instructors taught all courses. Two cohort groups were incorporated into this study to gain a sample of 33 students.

The interviews were the final form of data collection. The pre-LEP CCI (Cognitive Complexity Indicator) score was subtracted from the post-LEP CCI score for each student. The difference scores from the pre-LEPs and post-LEPs were divided into natural clusters or groupings. Natural clusters are data groupings where the dataset breaks in pattern.[23] Nine students from each delivery model were selected for interviews across the range of difference scores. Students were selected to represent each natural cluster division of the difference scores. For the non-cohort, intensive format, the difference scores clusters were -30 to -23, -14 to 3, 20 to 29, and 43 to 68. For the cohort, accelerated format, the difference scores clusters were -80 to -27, -18 to 14, 20 to 30, 47 to 53, and 80 to 93. An equal mix of students from each delivery model performing across the range of difference scores was selected for interviews based on the quantitative results.

Research Findings

Demographic data were collected to describe the participants. Of the 49 students who started the study, 42 were still participating at the conclusion of the study. The average age of the students was 33. The majority of the students were female and Caucasian. They had an average of 14 years of full-time work experience. Over one third (39%) of the students had never attended a college or university prior to this time. The mean cumulative GPA for the sample population was 3.42.

The pre-LEP CCI recorded that all students began the programs at least at Position 2, "Multiplicity Pre-Legitimate". The CCI score for the pre-LEP results ranged from 220 to 444. Therefore, the students entered in Positions 2, 3, and 4 according to Perry's scheme. Analysis of the pre-LEP and post-LEP CCI scores demonstrated that some student scores increased, some stayed approximately the same, and others decreased. (See Table 1.) The range of scores for students in the non-cohort intensive schedule demonstrated an overall increase: Pre-LEP CCI scores range (220-386); and post-LEP CCI scores range (243-420). These ranges showed an overall gain by this group of students. The overall range for the students involved in the cohort program did not reflect the same increase: pre-LEP scores range (250-444); and post-LEP CCI scores range (257-407). Essentially, there was a decline in the overall range for the cohort model.

What about those students who recorded a decrease in CCI score from the pre-LEP to the post-LEP? The one common element for these students in the non-cohort model was that they did not move to a different position. If they decreased in CCI scores, they stayed within the score ranges for the position. For instance, the CCI calculation formula produces scores between 200 (a stable Position 2) and 500 (a stable Position 5).[24] One example of this was a student who scored 273 on the pretest and 243 on the posttest. Although the student score decreased, she did not change in position and remained at Position 2. Three students in the cohort program whose CCI score decreased moved from Position 3 to Position 2. Perry used the term "Retreat" to describe a regression to an earlier Position.[25] More specifically, Perry defined "Retreat" as "...entrenchment undertaken as a reaction to the complexities experienced in a more advanced Position."[26] Only one of these students was interviewed; his pretest CCI score was 307, and his posttest CCI score was 277. This student demonstrated that he was transitioning back to Position 3 by his comments.

In contrast to those students whose CCI score decreased, those whose CCI score increased sometimes demonstrated a change in Position. For instance, one student's score moved from 293 pre-LEP to 382 post-LEP while another's score moved from 274 pre-LEP to 354 post-LEP. Based on pre-LEP and post-LEP scores alone, seven students (16%) moved from Position 2 to Position 3 over the semester period. Two of these students were members of the intensive non-cohort model, and five were from the accelerated cohort format.

It was noted earlier that there was no increase in the overall range of the pre-LEP and Post-LEP scores for the cohort model. The majority of the students (68%) had a pre-LEP score in Position 3, and the post-LEP scores recorded 79% of the students in Position 3. The strength of the dominant Position in the group seemed to have kept the score range centered on Position 3. The dominant cognitive Position of the cohort group may have influenced the development of individual students. However, the effect was not developmental for the student at Position 4. This student was a member of the cohort program and scored solidly at "Relative Subordinate Position", Position 4, in her pre-LEP, post-LEP and analysis of her interview. In her interview, this student expressed frustration with her classmates and instructors who did not want to discuss material beyond the information level. This level of activity was also confirmed by classroom observations. Although there are many factors that affect each person's life, a question was raised about whether the cohort experience might also constrain a student's cognitive development.

Table 1

Difference Scores for Cognitive Complexity Indicators: Post-LEP Minus Pre-LEP

Difference Scores	*Intensive Non-Cohort Students*		*Accelerated Cohort Students*		*Total*	
	Number n=14	*Percentage*	*Number n=28*	*Percentage*	*Score Range*	*Percentage*
Increase	7	50%	13	46%	14 to 93	48%
Relative Stable	3	21%	3	11%	-6 to 6	14%
Decrease	4	29%	12	43%	-9 to -130	38%

Note: "LEP" stands for "Learning Environment Preference".

The remainder of this section focuses on analysis of the classroom observations and interviews which demonstrated how the instructor, peers, evaluations methods, and classroom atmosphere potentially affected the cognitive development or non-development of adult undergraduate students in this study. Results are described below.

The Instructor

Analysis of the interviews and classroom observations revealed that the instructors' techniques can have both a positive and a negative effect on students' cognitive development. Three categories of instructors emerged from the observations. Type 1 instructors lectured, showed videos, asked questions of the students on a factual basis, and appeared to be the expert. Type 2 instructors lectured, but involved the students by asking them questions about the reading. These instructors also asked students for their opinions but did not ask them to question their assumptions. Type 3 instructors modeled critical thinking skills, asked the students to substantiate their opinions, and used debate in the classroom. The students at different levels responded differently to these types of instructors.

In their interviews, students expressed a desire for an instructor who met the needs of their particular Position of cognitive development. The students in "Multiplicity Pre-Legitimate", Position 2, expressed that they believed their instructors were experts. These students were very comfortable with Type 1 instructors. The instructors who asked factual types of questions were a comfort to these students because there was one "Right" answer. In the non-cohort program, if instructors were Type 2 and asked for more discussion and sharing of opinions, these students remained quiet. The students in Position 3, "Multiplicity Subordinate", had a desire for an open discussion in the class and for instructors to bring real life experience to the classroom. The Type 2 instructors who facilitated discussion and added their experiences to the material met these students' needs. The Type 1 instructor frustrated these students. From the observations, these students appeared bored, played games on their cell phones, and acted disengaged in the classroom. The Relative Subordinate (Position 4) student interviewed was not challenged by her instructors. She stated that she experienced lecture, some discussion, and some application, but in her courses the instructors did not ask for analysis. Classroom observations confirmed she experienced only Type 1 and Type 2 instructors.

There were only two instructors out of 12 observed who displayed Type 3 characteristics. They continually empowered the students to analyze, question, and interrelate concepts. The discussion level in these two classrooms consistently reached more complex cognitive thoughts. Both of these instructors stated in class that they wanted their students to think critically and to not be afraid to argue with them. The instructors wanted their students to question what they (the instructors) said and express their viewpoints, especially if they were in opposition to the instructor's view.

It is interesting that the students in the Type 3 instructors' courses were at Position 3, which would have made them comfortable with a Type 2 instructor. These students, however, were not frustrated by these instructors' approaches. The students responded positively in the classroom, were engaged, asked questions, and participated in the debates. However, these two instructors used techniques to bring the students up to this (Instructor Type 3) level. They began the discussion with knowledge questions. Second, they asked for opinions and for opposing opinions. Finally, they asked the students to debate the issues. The students were never asked to jump to debate without first discussing the topic. The techniques used by the Type 3 instructors coincide with Vygotsky's concept of scaffolding.[27] Scaffolding is giving support, clues, information, and reminders at the times that the student needs them and gradually allowing the student to think more independently. The students interviewed who participated in these two courses commented that each instructor was the best they had ever experienced and the course was their favorite. It made them interested in the topic. The course had "opened their eyes," and the students expressed a desire to continue learning. However, this limited exposure to a Type 3 instructor was not enough to move them to a more complex Position.

When instructors have students with different Positions in their classrooms, students may want a certain technique to match their level of cognitive development; however, this is not how growth occurs. Brookfield stated that one key to teaching critical thinking is to challenge students' old modes of thinking and provide structure and support for development of new ones.[28] Wlodkowski referred to this support as the" zone of proximal development", the phase in learning where students need assistance.[29] Education has the potential to be very powerful. It is only through challenging students that they develop and learn,[30] as was seen in this study. In summary, an instructor's techniques can affect the cognitive development of students. However, it is only through challenging and supporting the students that instructors can assist them in developing.[31] If instructors stay in students' comfort zones, students are unlikely to develop.

Peers

The study group phenomenon in the cohort program played out strongly. One student at Position 2 interviewed appeared to be transitioning to the next Position. This student commented that study group members had something to contribute:

> Yeah, I think they all bring something to the table. I think some more than others. Definitely some people shine in their writing.

This student further stated that he had learned from his mistakes and with the help of a study group member was improving his writing. His comments demonstrated that there was some acknowledgement that he could learn from his classmates in limited areas. Perry stated that students who begin to see their peers as sources of knowledge begin the process of transitioning to Position 3.[32]

Students in Position 3, "Multiplicity Subordinate", liked hearing from their classmates and at times instigated discussions to hear others' viewpoints. The study group concept seemed to work well for these students, and they created close bonds with their study group members. The study groups grew so tight that they often wanted to outperform other groups on their presentations. One student stated:

> And even within the classroom environment there's competition between the study groups. When you have group projects, all the groups are trying to outdo the other groups. I think that leads to some positive competition. It kind of makes people kind of go above and beyond what they typically would do, because they want... to provide a better presentation and show that they can put on a better presentation than the other groups.

Bandura's research described a concept called collective self-efficacy in which the group encouraged all members to pursue higher goals and to perform at higher levels.[33] Bandura further stipulated

that seeing their classmates perform successfully can raise the belief of the observers to also perform at that level or higher. Vicariously derived information alters perceived self-efficacy.[34]

However, the study groups may have been a frustration for students who were not at the same Position as the others. This was the situation for the one student interviewed who was at Position 4. She did not find her classmates a source of knowledge; so the experience of working in a group was less desirable. This student made specific reference to names of two fellow study group members with whom she shared ideas and said it was beneficial to have them in her group. Upon review of the LEP scores for her study group, it was discovered that these two students recorded Position 3, "Multiplicity Subordinate", with CCI scores of 340 and 359. The students she did not enjoy in the group recorded LEP scores in Position 2, "Multiplicity Pre-Legitimate". Based upon this student's comments, study group or small group assignments may be beneficial if the fellow members are close to the same Position of cognitive development, but if there is a variance in the cognitive development, frustration may occur.

Mentkowski and associates found that experiences of working collaboratively in groups seemed to provide a stimulus for students to reflect.[35] As students listened to the viewpoints of others, they formed their own ideas, developed in their capacity to relate to others, and learned to appreciate what others had to contribute. In this study, the responses of students in the interviews concerning their study groups seemed to support this for the students in Positions 2 and 3. In summary, group interactions can influence cognitive development. Students who are at a lower Position in a group setting can be challenged by the others. This challenge assists them in developing more complex thinking skills. However, students who already possess more complex ways of thinking (e.g., the Position 4 student) may be frustrated with group members who are two Positions lower.

Evaluation methods

The evaluation methods that students identified positively fit the Position of their cognitive development. For example, students at Position 2 liked multiple choice tests, and students at Positions 3 and 4 liked essay exams and the opportunity to express themselves. However, in order for evaluative methods to be a positive influence on cognitive development, they must challenge students. While instructors need to keep in mind the Position of cognitive development of students in their classrooms, those who rely upon multiple choice exams requiring only factual information meet the needs of only a Position 2 student. However, as this limited study recorded, there are students at all different levels of cognitive development in each course. As referred to earlier, only two instructors stated to their students that they wanted them to think critically and then used questioning techniques during classroom discussions that supported this statement. These instructors also used essay exams as an evaluation method.

Brookfield stated that for critical thinking to be developed, two central activities are identifying and challenging assumptions and exploring alternative ways of thinking and acting.[36] A few evaluative methods that incorporate these are journaling, autobiography, analysis and research of controversial issues, and critical incidents. In addition, critical questioning must be used in the classroom.[37] In summary, the instructor's goal must be to assist students in developing more complex ways of thinking.[38] Instructors can push students to develop cognitively by the type of evaluative method chosen. Low level knowledge questions do little to promote growth. The interview data showed that students in Positions 3 and 4 liked the opportunity to think outside the box and to create their own ideas. Instructors need to choose evaluative methods that allow students to explore their own ideas and give effective and prompt feedback to the students.

Classroom atmosphere

The classroom atmosphere may have been another dimension that either stifled or promoted cognitive development. Based on classroom observations, in one section of the introduction to business course in which the instructor showed videotapes and students never shared their opinions about the topic, students did not experience a discussion above the knowledge level (just the facts). The one new student in this course who completed the study stayed in the "Multiplicity Pre-Legitimate", Position 2. The second section of the introduction to business course where the instructor purposefully asked the students to think critically, analyze the material, and held debates in class continually held the students at a higher level. The two new students in this section increased their LEP CCI in the "Multiplicity Subordinate", Position 3. These students commented on the open classroom, and they made positive comments about being able to express their opinions in class. They believed that others were respectful of their opinions even if they disagreed. Students liked being able to disagree with the instructor and debate issues.

Brookfield and Preskill stated that "discussion is one of the best ways to nurture growth."[39] It is only through collaboration and cooperation with others that students are exposed to different views.[40] The students in this study supported the position of Brookfield and Preskill when they commented that at times the classroom discussions caused them to change their perspective. In summary, the classroom atmosphere can contribute to the cognitive development of the students. If the classroom is open to diverse opinions and students can share freely and honestly, then through this discussion students may be challenged and their assumptions examined. If the classroom atmosphere does not allow students this type of dialogue, they are likely to remain stagnant at their cognitive Position.

Conclusion

What experiences potentially influenced adult undergraduate students' development or non-development of cognitive complexity? The instructor had a key role in the students' development of more complex cognitive thinking. The instructor was responsible for the techniques used in the classroom, the creation of the classroom atmosphere where students could express themselves, and the choice of evaluation methods to include small group assignments. Two instructors used questioning techniques in the classroom, which caused the level of classroom discussion to be more complex. For these two instructors, it was a conscious decision to use critical thinking techniques and evaluative methods in their courses that allowed students to express their opinions and debate issues. They both stated this to the students in class sessions observed. Kegan indicated that the instructor has a key role in creating the learning environment and building a bridge to help the student's progress to more cognitive complex thinking.[41] The results of this study reinforced that idea.

Interaction with other students had a role in the cognitive development. Small group assignments also seemed to have contributed to the students' cognitive development. All students from the cohort

program were required to be members of a study group and required in every course to complete small group assignments. Most of the students interviewed consistently spoke of their study group members as a positive influence on their learning. As one student stated, "You have all those minds to pick from, all those different opinions." However, too much spread in the Positions within a study group may cause some frustration, as evidenced by the one student interviewed at the "Relativism Subordinate" Position 4. She was able to connect with only two other students in her group of five. These students were just one position below her based on their LEP scores, but she was frustrated with others who were two positions lower.

This study looked at specific influences on the cognitive development of adult students in two settings. The results of this study demonstrated that some students increased in cognitive complexity according to Perry's scheme. From this study, one cannot identify a single experience that is solely responsible for assisting students in developing more complex ways of thinking. It is possible to state that adults are not stagnant in their cognitive development and that participation in higher education provides multiple avenues for development. In this study, instructor techniques, discussion with peers, evaluation methods, and classroom atmosphere were investigated. All of these had the potential to assist students in developing more complex ways of thinking.

Endnotes

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