

Supporting and Challenging Student Cognitions in the Classroom

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Abstract. This article reports results of a mixed methods exploration of the effects of reflective supervision on cognitive growth in undergraduate students. Students were enrolled in two sections of an introductory skills practice course containing an experiential exercise designed to enhance skill development. One group received supervision; the other did not. Pretest and posttest analyses of measures used to assess cognitive development showed no statistically significant gains for either group. However, the group receiving supervision made more gains, and analysis of qualitative data revealed evidence of cognitive growth for this group. The research supports further investigation of educational interventions that may promote cognitive development in undergraduate students in helping professions and allied health fields.

Keywords: cognitive development, experiential learning, mixed methods, Perry Scheme, supervision

One purpose of undergraduate education in the United States is to help students develop the capacity and skills needed for complex decision-making. With the ever-changing landscape of societies across the globe, graduates will encounter highly complex individuals, groups, and communities. They will need to be cognitively capable of understanding and analyzing multiple issues and making informed decisions even when confronted with conflicting information. Students with a high degree of cognitive complexity can be more flexible, open to new information, use creative problem-solving (Streufert & Swezey, 1986) and use a larger number of intervention alternatives (Duehn & Procter, 1974) than people with low cognitive complexity, who may have problems with various aspects of helping such as empathy and nonjudgmental attitudes (Lyons & Hazler, 2002; Stoltenberg & Delworth, 1987). This is particularly important for professionals who interact with these individuals and communities on a daily basis, such as law enforcement and corrections (Morgan, Morgan, Foster, & Kolbert, 2000), teaching (Smith, 2015), counseling (Granello, 2010), social work (Simmons & Fisher, 2016), and nursing and allied health professions (McComb & Kirkpatrick, 2016). However, teaching discipline-specific procedural skills alone may not be sufficient to bring about cognitive change needed for effective practice (Anastas, 2010). Helping students develop cognitive skills that will facilitate complex interactions must be intentional and should not be left to chance (Gibbons & Gray, 2004; Fong, Borders, Ethington, & Pitts, 1997).

Relevant Literature

Studies across disciplines have found that students in helping professions do not make significant gains in cognitive development until they are in their final practicum or internship experiences (Brendel, Kolbert, & Foster, 2002; Granello, 2002; Simmons & Fisher, 2016), perhaps because of real world experiences encountered in the internship accompanied by reflective supervision (Blocher, 1983; Fong et al., 1997).

However, research suggests that the development of higher order cognitive skills early in a program may help students approach learning and actual practice at a more complex level in advanced courses and internships (Duys & Hedstrom, 2000). In order to develop complexity in thinking and behaviors, students need to develop confidence in their own abilities, which motivates them to move from solely receiving knowledge to trusting in their intuition to construct knowledge (Belenky, Clinchy, Goldberger, & Tarule, 1986; Love & Guthrie, 1999). If classroom instructors understand where students are developmentally, they may offer the right amount of support and challenge to enhance development (Perry, 1970, 1999). They could, in effect, create an ideal environment for cognitive development.

In this paper, cognitive developmental theory will be used to explain cognitive processes among students in general and to discuss what processes may be occurring in the academic environment. With this in mind, educators may be better able to assist students in making cognitive shifts.

The Perry Scheme

One method widely utilized for conceptualizing and intentionally addressing college student cognitive development is the Perry scheme (1970, 1999), which focuses directly on “the voice of the students” (Perry, 1999, p. xiv) and explores epistemological development. The Perry Scheme uses categories and positions within categories to describe development during the college years (Perry, 1970). The categories are dualism, multiplicity, relativism, and commitment within relativism. A summary of the scheme is contained in Table 1. Commitment within relativism has to do with ethical and moral development, and is beyond the scope of this paper.

Table 1

Learner Characteristics of Students and Perry Positions

| | Dualism | Early Multiplicity | Late Multiplicity | Contextual Relativism |
|-------------------|------------------------------------|--|--------------------------------------|--|
| View of Knowledge | All knowledge is known. There is a | Most knowledge is known. There is a right way to | We know some things for sure, but in | All knowledge is contextual. There is no |

| | Dualism | Early Multiplicity | Late Multiplicity | Contextual Relativism |
|---------------------------------------|--|---|---|--|
| | right and wrong answer for everything. | find the right answers. Some knowledge is "fuzzy." | most areas we do not know anything. All opinions can be equally valid. | Absolute Truth, but right and wrong can exist within specific contexts. |
| View of the role of the instructor | Source of knowledge. Good instructor = absolute authority and knower of truth. | Source of right way to find knowledge. Role is to model the way. | Source of the process of thinking. Instructor can also be completely discounted. | Source of expertise. Role of expert-guide-consultant. Authority earned through having expertise. |
| View of the role of the student | Role is to receive information. | Role is to learn how to learn. | Role is to learn to think for oneself and to learn to use supportive evidence. Independence of thought is valued. | Role is to exercise the use of the intellect and shift from context to context. |
| View of peers in the learning process | Peers are not a legitimate source of knowledge. | Peers are more legitimate with respect to process. Interest in peers' opinions, but instructor still final authority. | Peers are quite legitimate, but opinions can be discounted, as well as everyone else's. | Peers are legitimate sources of learning if they use appropriate context. Seeking peers opinions is part of process. |
| Evaluation issues | Evaluation directly related to sense of self. | Evaluation is the primary issue: how are my answers | Independent evaluation by the student | Evaluation of work can be separated from |

| Dualism | Early Multiplicity | Late Multiplicity | Contextual Relativism |
|--------------------------------------|--------------------------------|------------------------|--|
| Bad/wrong answer = bad/wrong person. | judged? Fairness is paramount. | should get good grade. | evaluation of self. Good critique includes both positives and negatives. |

Students in dualism are learning how to learn. They believe that the student's role is to receive information from trusted sources of knowledge (Perry, 1970, 1999). Ambiguity, multiple perspectives, and disagreement among respected authorities are obstacles. They are much more comfortable with firm definitions of "right" and "wrong." Motivation for learning is extrinsic—driven by the grades they receive on assignments.

The dualism category contains two positions, basic (Position 1) and full (Position 2) dualism. Perry (1970) found that few students arrived at college in Position 1 (basic dualism), as this category described an almost childlike concreteness of belief in Absolute Truth and Authority. However, position 2 (full dualism) finds students beginning to be able to compare and contrast information and provide explanations for their answers, particularly if they are supported with a high degree of structure and careful sequencing of the introduction of diversity of thought.

The second category, multiplicity, represents the student's growing ability to incorporate uncertainty. This category of also contains two positions: early (Position 3) and late (Position 4) multiplicity. Students in Position 3 have come to accept that uncertainty and diversity of opinions are legitimate, but they consider the uncertainty temporary. Although still believing that all answers can be found with time, students in Position 3 see process instead of content for the first time. They need structure to support their development, but they are beginning to experience new freedom in learning (Perry, 1970, 1999).

The transition to Position 4 depends on the realization that we may never have the answer in many areas (Perry, 1970, 1999). Motivation for learning is still extrinsic; however, students come to understand that the best results are dependent on showing a reasoning process, rather than the correct answer. As they progress through multiplicity, they may show signs of intrinsic motivation. A familiar phenomenon of this stage is that students will often argue that any answer can be legitimate (and thus receive high marks), as long as the correct thinking process was followed. Students in Position 4 enjoy diversity of thought and may balk at structure; they are looking for a class atmosphere that promotes independence. These students are adept at the intellectual "game" (Cornfield & Knepfelkamp, 1979, as cited in Perry, 1999). These are clear indications that students are becoming more autonomous and are attempting to produce knowledge.

The third category, relativism, represents a fundamental shift in cognitive development. Students who reach relativism are able to ground “correct thinking process” in specific contexts and move toward looking to inner resources for knowledge and motivation for learning. This category also contains two positions: contextual relativism, Position 5, and commitment foreseen, Position 6. Students understand that right and wrong can exist within certain contexts, but there is no absolute truth. Relativism requires the ability to tolerate uncertainty and ambiguity. Although this position is what many professors try to instill in their students, studies suggest that few achieve full relativism prior to graduation (Granello, 2002).

This model is meant to be descriptive. Nonetheless, it can provide guidance for supporting student cognitive development and challenging students to move to the next level. The model provides insights that could be leveraged to promote student development in a way to foster essential facilitative qualities and skills to promote interaction with complex individuals and systems.

Cognitive Complexity Studies

Researchers across disciplines have examined the relationship between cognitions and facilitative qualities. Cognitive complexity has been associated with traits essential to helping relationships such as confidence and high psychological functioning (Birk & Mahalik, 1996; Brendel et al., 2002), more effective clinical hypotheses (Holloway & Wolleat, 1980), and skills such as critical thinking (Rapps, Riegel, & Glaser, 2001) and sophisticated descriptions of client characteristics (Borders, 1989). It has been linked to that most essential helping attribute, empathy (Benack, 1988; King Jr, 2011; Lovell, 1999) and multicultural competence (Cannon, 2008; Wendler & Nilsson, 2009), an essential quality for students in helping professions (see, e.g., Council on Social Work Education, 2015).

Researchers have also investigated the question of what factors impact cognitive complexity across professions. Several have shown that educational level is related to cognitive complexity (Brendel et al., 2002; Granello, 2002; Harrison & Atherton, 1990; Simmons, 2014). Brendel and colleagues (2002) tested students at the beginning, middle, and end of their training, and their findings suggested that most of the students did not show an increase in cognitive complexity until they had completed their training. Granello (2002) used the Perry Scheme to conduct a cross-sectional analysis of counseling students who were at the beginning, middle, and end of their training, finding that students made more gains in cognitive complexity when they were at the end of their education, after completing internships, than they made from the beginning to the middle of their training.

Simmons & Fisher (2016) clarified these findings by showing that although the internship experience was related to cognitive development, traditional classroom instruction was not. In the sample studied, the internship did not occur until coursework was completed, thus suggesting that the internship experience had unique properties contributing to cognitive development. The authors speculated that internship education provided the optimal environment for cognitive growth—

perhaps the combination of interaction with real-world clients plus guided reflection through supervision.

Pre-internship educational interventions to enhance cognitive complexity remain relatively unstudied. Using a pretest and posttest design, one study examined the cognitive complexity of graduate counseling students either taking an enhanced basic skills course or another introductory social work course (Duys & Hedstrom, 2000). In addition to lectures, the enhanced skills course included role play, structured small supervisory groups facilitated by doctoral students or faculty, and feedback and evaluation of skill development. They found students in the enhanced skills course made significantly higher gains in cognitive complexity than students completing the introductory course. The study suggested that role play and guided reflection might support cognitive development prior to the internship experience.

The Current Study

With these findings in mind, the authors of the current study sought to design and explore the effects of a pre-internship experiential educational exercise that included role play and guided reflection through supervision to see what effect, if any, it had on cognitive development in undergraduate students in a social work program. The details of the assignment are contained in Table 2.

Table 2

Assignment Details

| Assignment | Timing |
|----------------------------------|--|
| Pre-Self-Assessment | Beginning of semester |
| Classroom discussions | Weekly throughout semester |
| Five recorded role play sessions | Beginning at middle of semester and continuing biweekly until complete |
| Five supervision sessions | Following each role play session |
| Case Presentation | End of semester |
| Post-Self-Assessment | End of semester |

Over the course of the semester, graduate students learning clinical supervision reviewed undergraduate student role-play recordings and provided 30-minute supervision sessions following each role-play session that included verbal feedback. The graduate student supervisors also completed written evaluations of the undergraduate student skills at the midpoint and end of the semester and reviewed these in session with the undergraduate student supervisees. This allowed the students to begin to integrate classroom instruction with actual skills practice.

The undergraduate students conducted an end-of-the-semester case presentation to their classmates on their role play and received feedback from the instructor and the group. Finally, they completed a post-self-assessment to encourage further reflection on their development. Throughout the semester, students were supported and challenged in supervision sessions as well as in the classroom.

The present study was based on the assumptions that internship plays a significant role in the cognitive development of undergraduate students and these students make the most gains in cognitive development when they are in internship. What is unknown is whether they can make significant gains in cognitive complexity prior to the internship experience, i.e., whether cognitive development can be accelerated using guided reflection without exposure to actual clients. The purpose of this study was to explore the effect on cognitive development of role play supplemented with guided reflection through supervision of undergraduate students after 15 weeks of a pre-internship skills course.

A research question guided this research: Do undergraduate social work students' levels of cognitive complexity change after 15 weeks of a pre-internship course requiring a semester-long skills role play with supervision? Because this study was exploratory in nature, we made no formal hypotheses.

Methods and Results

The study used a consecutive mixed methods approach. The sample contained students from an introductory skills course who participated in role plays and received supervision. Students completed quantitative instruments testing their levels of cognitive complexity at the beginning of the semester and then 15-weeks later at the end of the semester. Following analysis of the quantitative data, the researchers analyzed a subset of students' post-self-assessments in an attempt to better understand the quantitative results.

Quantitative Data

Participants. The total nonprobability sample consisted of 37 students. The demographic characteristics of the sample and test statistics are provided in Table 3.

Table 3

Demographic Characteristics of Quantitative Sample

| <i>Variable</i> | <i>N</i> | <i>%</i> |
|-----------------|----------|----------|
| Gender | | |
| Male | 4 | 5.5% |
| Female | 33 | 45.2% |
| Age | | |
| 18-24 years | 27 | 37.0% |

| <i>Variable</i> | <i>N</i> | <i>%</i> |
|-------------------|----------|----------|
| 25-29 years | 4 | 5.5% |
| 30-34 years | 1 | 1.4% |
| 35-59 years | 5 | 6.8% |
| Ethnicity | | |
| European American | 13 | 17.8% |
| African American | 22 | 30.1% |
| Other | 2 | 2.7% |

Instrument. The Learning Environment Preferences Scale (LEP) is a 65-item questionnaire that measures cognitive development (i.e., dualism, multiplicity, contextual relativism) along five domains that contribute to student learning (i.e., view of knowledge/learning; role of the instructor; role of the students and peers; the classroom atmosphere/activities; and evaluation methods) according to the Perry Scheme (Moore, 1990). Each domain contained a stem with 13 statements that participants rate as important or significant. To reflect student learning in social work, “to learn social work” was added to the general stems. This is consistent with changes made in previous research using the LEP (Granello, 2002, 2010; Simmons, 2014; Simmons & Fisher, 2016). Students were asked to rank the three most important statements out of 13 statements in each domain. The rankings were then used to compute students’ Cognitive Complexity Index (CCI) scores, which is a single numerical score between 200 (Dualism) and 500 (Relativism). CCI was reported as a reliable subscale, with the alpha coefficients for the CCI—by position—reported as .72 to .84, and the test-retest reliability was .89 (Moore, 1990). Criterion, concurrent, and construct validity were explored and found to be acceptable (see Moore, 1990, for a detailed discussion of the LEP’s psychometric properties).

Procedures. Emails with a link to the informed consent and pretest survey were sent to all students in two sections of an introductory practice course (SW 335) before the start of the semester. At the end of the semester, an email link to the posttest was sent to the students. Procedures complied with the university’s institutional review board requirements. The surveys were administered online. No identifying information was collected. In order to match a students’ pretest with their posttest, students were given a set of questions at the beginning of each survey, which produced a unique identifier. To address the research question, students completed the LEP and demographic information at the beginning and end of the semester.

Analysis and results. A paired-samples *t*-test was conducted to determine whether there were significant differences between pretest and posttest scores for the students on mean change in cognitive complexity. Table 4 shows cognitive complexity pretests and posttest means and standard deviations for cognitive complexity, and the results of the paired-samples *t*-test. The test revealed that although mean CCI scores increased, there were no statistically significant changes in cognitive complexity from pretest to posttest. Results showed that 57% of the

students made gains in cognitive complexity, 2% made no gains, and 41% showed decreases.

Table 4

CCI Means and Standard Deviation for Demographic Variables

| | N | CCI pre | | CCI post | | t(df) | p |
|--------------|----|---------|------|----------|------|----------|-----|
| | | M | SD | M | SD | | |
| Gender | | | | | | - | - |
| Male | 4 | 314.5 | 37.6 | 318.0 | 29.4 | | |
| Female | 33 | 314.2 | 44.1 | 321.9 | 34.4 | | |
| Age | | | | | | | |
| 18-24 years | 27 | 318.4 | 39.4 | 315.2 | 29.6 | | |
| 25-29 years | 4 | 289.3 | 70.0 | 345.5 | 15.0 | | |
| 30-34 years | 1 | 390.0 | - | 396.0 | - | | |
| 35-59 years | 5 | 294.4 | 12.7 | 321.2 | 50.9 | | |
| Ethnicity | | | | | | - | - |
| European | | | | | | | |
| American | 13 | 318.4 | 31.2 | 320.7 | 27.2 | | |
| African | | | | | | | |
| American | 22 | 308.0 | 48.0 | 320.8 | 34.9 | | |
| Multi-Ethnic | 2 | 356.5 | 47.4 | 333.0 | 89.1 | | |
| Total | 37 | 314.3 | 43.0 | 321.4 | 34.5 | -.97(36) | .34 |

Note. n = 37. CCI = Cognitive Complexity Index.

Qualitative Data

Participants and Instrument. Twenty-five of the 37 students enrolled in the courses completed written post-self-assessments as part of their course requirements. The post-self-assessment was designed to help the students assess their progress over the course of the semester. The students provided a summary of strengths and growth areas as professional practitioners and discussed critical incidents from the semester, chosen models or theory of practice, knowledge of culture and the importance of relationships, a summary of what was learned over the semester, and future goals as a professional social worker. Although not administered specifically to assess cognitive complexity, the researchers explored patterns in the qualitative data that might yield additional information regarding cognitive development.

Data analysis. In the first cycle of exploratory analysis, provisional themes derived from Perry’s Scheme were used to summarize the raw data into categories, segmenting the text into meaningful units, and assigning codes and labels (Miles, Huberman, & Saldaña, 2014). The team adjusted themes and codes during the second cycle, looking for patterns and other ways to organize the data. The team then coded the data using the themes derived from this process using a continuing

iterative process that reflected an interactive model of data analysis. The team engaged in ongoing dialogue and reflection, referring to the coding, original data, and the audit trail when needed to further refine themes and reach consensus. The researchers used triangulation of data and thick descriptions (Lietz & Zayas, 2010) to protect reliability.

To further increase the reliability of the analysis and check for reactivity and bias, the researchers utilized a third qualitative analyst who was not involved with the present study, had not taught students, and did not know the identity of the students in the study. The external analyst did not have access to the manuscript or coding and themes as developed by the research team. The external analyst initially had only post-assessments, the research question, and a copy of Perry's Scheme.

The external analyst coded the text that described experiences in relationship to Perry's model using a matrix that ranked text along the continuum of development of cognitive complexity. The purpose of this ranking was to elicit information that illustrated where students were in terms of development of cognitive complexity. Data was subsequently coded into themes representing similar concepts, such as development and use of specific skills, self-awareness and personal learning, contextualization of learning, and motivation to learn and improve skills. The results of the external analysis were compared with the research team's analysis and further review and discussion indicated consistency.

Results. The analysis resulted in two broad themes related to cognitive complexity: indicators of position within the Perry Scheme and skill development with and without complex understanding. Both themes were related to the research question in that they provided information about cognitive development. The data illustrated that development for the group with supervision was fluid, with some students showing both multiplistic (more advanced) and dualistic (less advanced) ways of thinking. As students assessed their overall progress, knowledge learned, and skill development, however, a view of their progress emerged.

The first broad theme, position within the Perry Scheme, generally revealed suggestions of movement within the stage of multiplicity. As students move through multiplicity, they develop greater openness to new/other perspectives and information. Their motivation to learn moves from being extrinsically to intrinsically motivated, and critical thinking develops and deepens. Students indicated a deepening openness to other perspectives. As one student stated, "[t]aking this class has opened my eyes to the definition of culture. Before this class I considered a person[s] ethnicity the base of their culture but it is much more than just that." Additionally, they demonstrated increased openness, understanding, and application of social work practice perspectives: "When I first entered this course, I ha[d] always wanted to help people that [do] not have access to things that are available for them. Now, I use the strengths perspective to empower a client." Another student reported, "I am in a better position to empathize with others."

Many students reported new excitement and confidence in their ability to learn. One student stated, “[g]aining new knowledge about the field of social work has given me a drive to continue to gain knowledge about being a better social worker.” Another student related,

I have worked hard in this course and hope that my service learning paper and the final will give me an A. If it does not, then I will gladly take the grade that is given to me because I feel that the knowledge that I gained in this class is unmeasurable.

To be sure, many students remained firmly entrenched in extrinsic motivation. As one stated, “The goals I set early this semester [were] to complete all assignments and make a B or greater in this class.” These students placed great emphasis on their grades when discussing whether their goals had been met.

Some students expressed an increase in confidence over the course of the semester, which also demonstrated growth:

I found out that I have really good social work skills while doing the role plays and meeting with my supervisor these last three months. In the beginning, I wasn’t sure if social work was the right career choice for me but now I feel like it fits well.

Another student declared, “With each day that passed I felt more confident....”

The final category showing movement within the positions was increasing capacity for complex thinking and problem solving. This was shown through increasing belief in the process, rather than the result: “‘you can’t save everyone’...helped me realize that at the end of the day when you have done your best as a trained professional that is really all you can do.” Increasing tolerance for ambiguity was noted: “It can be stressful and overwhelming, but I think that this something that will just come in time with practice.” One student summed up her growth as follows:

I have learned that social work is not black and white, there is room for the “what if’s” in social work practice. I have learned that social work is more than just what is in the book. I have grown in the aspect that I have questioned my thoughts and action[s] more and the client situations less.

The second major theme that emerged was skill development. Differences between development with and without complex understanding were illuminated. Students at a less complex level reported their learning in a mechanistic fashion, without any evidence of the implicit cognitive processes that accompany the skills: “I have [grown] in many areas. I am now more comfortable asking questions and asking open-ended questions.” Another reported, “I didn’t have any idea about the different stages in assessing a client.” Other the hand, students who demonstrated cognitive growth were able to interweave complex thought processes that accompany the use of skills:

I was not aware of all the planning that takes place before meeting with a client or the stresses of worrying if you have done right by your client.

Another explained, "I have learned how to build new theories from practice as well as old ones. I have learned how to think more critically about the different types of clients and their situation[s]."

Discussion

The goal of the study was to explore undergraduate students' cognitive development during an introductory practice course taught with supervision of role plays. The quantitative analysis shows students did not make statistically significant gains in cognitive complexity from beginning to end of the semester. This is inconsistent with the Duys & Hedstrom (2000) study finding that graduate students made significant gains while enrolled in a pre-internship skills course using guided reflection through supervision and other studies showing undergraduate students may make similar gains in cognitive complexity (Simmons, 2014; Simmons & Fisher, 2016). The lack of statistical significance could be due to the small sample size reflecting an issue of power. It may also be that, as speculated in similar studies, the construct of cognitive complexity is so global that it is hard to see significant changes over the course of just one semester (see, e.g., Fong et al., 1997). Indeed, Morgan et al.'s (2000) study of law enforcement trainees and criminal justice students revealed no significant changes in cognitive development following an educational intervention involving guided reflection, even though scores moved in a positive direction. Morgan et al. also speculated the small sample size and short duration of the study contributed to those findings.

It is worth noting that the undergraduate social work students in this study who received supervision made higher numerical gains in cognitive complexity than the students without supervision (7 points versus 1 point). Previous research using the same instrument (CCI) showed that students' growth measured over the course of the entire pre-internship program was relatively small (2 points) (Granello, 2002), or even declined in complexity (-10 points) (Simmons & Fisher, 2016).

The qualitative data supports the speculation that growth for students at this stage is highly individualized or perhaps too nuanced to detect with the instrument used. In the quantitative sample, 57% (21 students) made gains, 41% (15) showed decreases in complexity, and 2% (1) stayed the same. The qualitative data sheds light on this finding: even among those students whose cognitive functioning was assessed as primarily dualistic, in certain areas they demonstrated movement toward multiplicity. For example, growing diversity of thought was illustrated by the students' reports of openness to and embracing new information concerning topics from culture to theory/perspective, growing ability to empathize, and movement toward intrinsic motivation to learn. On the other hand, entrenchment in external motivation by some illustrates the idea that while developmental models are helpful for explaining growth, individual students can vary widely at any given point in the program (Granello, 2002). Indeed, Morgan et al. (2000) attributed the lack of significant change in their study to what Piaget called *décalage*—the "way in which

development can be haphazard or uneven and often occurs as a result of cognitive dissonance which accompanies psychological growth" (p. 215).

The concept of *décalage* is mirrored in the Perry Scheme by the notion of disequilibrium: students faced with a novel learning task may experience a temporary regression or lag in cognitive development (Perry, 1970; Widick, 1977). It is possible that the students involved in the role play with supervision faced great disequilibrium due to the added unknown and potentially complicating factor of supervision.

Limitations

The lack of significant results, of course, greatly limits the generalizability of the study, as does the use of qualitative data. In addition, this study used a small, non-random sample from a single social work program.

Implications

Educators can use the Perry Scheme to support and challenge students so that their cognitive development supports facility in addressing the complexities of professional practice, especially such skills as critical thinking and the ability to "go beyond prescriptive solutions to complex problems" (Harrison & Atherton, 1990, p. 87). Educators should work to discover and create learning activities that advance students' cognitive abilities prior to internship. This study suggests that experiential learning paired with opportunities for reflection may support cognitive development. However, one cautionary note is that researchers may not be able to rely on solely quantitative measures to explore cognitive development. Qualitative measures may provide much more nuanced and instructive insights for educators.

Future iterations of the exercise should be developed, implemented, and studied to ascertain the effects of guided reflection through supervision on cognitive complexity. There is a need for studies across disciplines and professions with higher numbers of participants and more robust design to help with generalizability. Furthermore, students participating in guided reflection through supervision may need additional support to maintain their equilibrium at the beginning of the exercise due to the added novelty of the supervision experience.

Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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