Examining Pedagogical Belief Changes in Teacher Education
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Abstract
This study is an investigation of the effects of intentional conceptual reflection and progressive ideology applied as an instructional methodology on pre-service teachers’ pedagogical beliefs over one semester. Pedagogical belief change was measured in two ways. Students took the Teacher’s Survey: Combined Versions 1-4 Part J (Becker & Anderson, 1998) before and after the class. A paired samples t-test revealed statistically significant ($p < .01$) changes in their pedagogical beliefs although the practical significance of these findings is less compelling. The researchers also used an a priori context analysis to code personal educational philosophies written by students before and after the class. A Chi-square test of the changes revealed no statistically significant change in pedagogical beliefs ($p = .71$). The disparity between these findings is discussed along with future areas for research.

Introduction
Over the last several decades there has been a shift in beliefs about the fundamental goals of education itself. These shifts are in response to societal changes, in particular, advancements in technology (Roblyer & Edwards, 2000). Over the past 30+ years, the world has changed. In the 1970s, an informed citizen was a person who had acquired “basic skills—such as reading, writing, and arithmetic—and an agreed upon body of information considered essential for
everyone” (Roblyer & Edwards, 2000). Students entered grade leveled classrooms where desks were organized in rows with the teachers’ desk prominently at the front of the room. Curriculum was similarly organized around subject areas with a focus on specifically enumerated skills that were hierarchically arranged, sequenced, and transmitted to learners by an expert or teacher. Educational goals were to prepare students who had basic skills in academic content areas. Technology in classrooms echoed those goals. Film strips, overhead projectors, educational television programs were used to provide students with information related to knowledge and skill acquisition. Predictably, assessment was focused on evaluation of and documentation of levels of mastery of those skills. Teachers’ roles were to deliver content to students and measuring their mastery of that content. Computers had found their way into some classrooms and were used to augment acquisition of knowledge and skills. Over the last three decades, as technology has permeated society, the needs of society have changed.

The demands of the Information Age coupled with the potential of technology require that educational goals be expanded (Williams & Williams, 1997). In response to the complexities of society, educational goals must also include the ability of children to “recognize and solve problems, comprehend new phenomena, construct mental models of those phenomena, and given a new situation, set goals and regulate their own learning” (Jonassen, Peck, & Wilson, 1999). This calls for pedagogical shifts from teaching as “transmitting a body of knowledge that is largely memorized to one that is largely process oriented” (Conway, 1997). Students ask questions; identify issues or problems; hypothesize; gather; organize; explore; interpret; analyze; evaluate; draw conclusions or generalizations; make decisions; perform tasks; resolve conflicts; collaborate; evaluate; and communicate. Instructional strategies must also be re-defined to enable children to attain academic standards as well as engage in more complex learning processes.
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(constructivist) such as those described above. Various educational organizations have responded to these expanded educational goals by reorganizing standards and curriculum that stress learning processes, inquiry, exploration, deep conceptual understandings, active construction of knowledge, collaboration, metacognition, self-evaluation, knowledge integration, and context (National Council of Teachers of English & International Reading Association, 1996; United States National Research Council, 1995). Similarly, teaching standards have changed (Council of Chief State School Officers, 2004; Pennsylvania Department of Education, 2001). These reforms require a very different set of teaching skills—skills that are progressive in their orientation. Teachers set the stage for learning; challenge; re-direct; facilitate; probe; question; create doubt or disequilibrium; model; provide resources; evaluate explanations; and assess understandings and processes.

Despite this call for shifts in educational belief practices, there is evidence that suggests pre-service teacher beliefs align with a transmissive model (Anderson, 1994; Florio-Ruane & Lensmire, 1990; Kagan, 1992; Morine-Deshimer, 1993; North Central Regional Educational Laboratory, 1994; Weber & Mitchell, 1996). An important question is whether or not their beliefs can be change during the course of their teacher preparation programs. As an intermediary step, this research focuses on changes during a single course.

**Literature Review**

Personal beliefs and attitudes influence actions and identity (Kagan, 1992; Morine-Dershimer & Kent, 1999; Pajares, 1992). Witcher et al (2001) citing Doll (1996) identify two major beliefs systems in current American public schools—transmissive and progressive. Transmissive and progressive beliefs define opposite ends of a one-dimensional scale of pedagogical beliefs. Pre-service teachers tend to have beliefs about knowledge, learning, and
teaching (pedagogical beliefs) that align with a transmissive model and view themselves as information givers (Anderson, 1994; Florio-Ruane & Lensmire, 1990; Kagan, 1992; Morine-Deshimer, 1993; North Central Regional Educational Laboratory, 1994; Weber & Mitchell, 1996). Other studies such as those done by Ravitz, Becker, & Wong, (2000) and Witcher et al (2001) find that student enter teacher preparation programs with eclectic pedagogical beliefs. Although there is some disagreement in this literature, none of the studies show students entering with the kind of progressive beliefs that align well with best practices as described above (National Council of Teachers of English & International Reading Association, 1996; United States National Research Council, 1995). These beliefs are particularly unyielding in part because of a student’s history of experiences in education. These “early experiences strongly influence final judgments, which become theories (beliefs) highly resistant to change” (Pajares, 1992, p. 325). The influence of educational experiences on pedagogical beliefs and practices is well documented in the literature. Teachers tend to adopt instructional strategies that emulate those they have experienced as learners even when the strategies are not pedagogically sound (North Central Regional Educational Laboratory, 1994). Personal beliefs and practices are also garnered at the higher education level. Pedagogical beliefs in higher education are traditionally teacher-centered and lecture-based; however, these practices “…have less to do with the proven effectiveness of the particular practice than the desire to appear legitimate or conform to normative expectations” (Jaffe, 2003, p 229). Thus, pre-service teachers may be further acculturated to transmissive models in their content areas or general education courses before beginning their teacher preparation classes.

While some studies indicate pedagogical beliefs are stable and resistant to change (Kagan, 1992; Kennedy, 2000; Murphy, 2000) other studies present a more optimistic view
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(Morine-Dershimer & Kent, 1999; Pajares, 1992). Challenging pre-service teachers prior pedagogical beliefs by allowing them to explore alternative ideas and approaches individually and as a learning community in education courses is one strategy that may facilitate pedagogical belief change (Bullough, 1991; Resnick, 1987). Opportunities for pre-service teachers to observe and practice alternate instructional methods in schools and classrooms that encourage self-evaluation and reflection on practices as well as modeling, mentoring, and coaching play a significant role in pre-service teacher belief change (Albion & Ertmer, 2002).

Critical to conceptual change is reflection (Hiebert & Carpenter, 1992; Kilpatrick, 1985). Reflection--that is intentionally, actively, and deliberately examining one’s experiences and beliefs--contributes to conceptual change. Sinatra and Pintrich (2003) emphasize the role of the learner’s intention in knowledge change. The idea of intentional conceptual change places the impetus for making these shifts within the learner’s control and it is goal-directed (Sinatra & Pintrich, 2003). Thus learners construct understandings in a mindful way, with intention to examine, monitor and regulate their learning. This view, however, assumes that learners are motivated and spontaneously revise their conceptual knowledge. Hatano & Inagaki (2003) believe that expecting learners to engage in spontaneous self initiated examination of their concept knowledge is unrealistic and, further, they explore the notion of conceptual change as induced “through comprehension activity led by a teacher and supported by peers” (p. 408). Under this assumption, intentional conceptual change is both highly personal and social.

In education, where pedagogical practices are regulated by beliefs that are formulated by lived experiences over the course teachers’ cumulative school lives (Britzman, 1991), examining pedagogical beliefs and assumptions, reflecting on prior personal experiences, setting goals for
change, engaging in self-reflection and regulation appear to be strategies that may facilitate belief change and the development of new meanings (Boud, Keogh, and Walker, 1985).

Additionally there is evidence that teacher education programs that embrace and operate within a more progressive orientation where pre-service teachers examine their own beliefs and then build upon those, are able to report significant development including belief change (Wideen, Mayer-Smith, and Moon, 1998). Further, increasing opportunities throughout their educational experiences for pre-service teachers to be embedded in activities that model progressive pedagogy (North Central Regional Educational Laboratory, 1994) is a recommended strategy for pedagogical belief change.

Research Question

Does situating pre-service teachers in a course that employs and models progressive methodology, supports self-examination of and reflection on beliefs, and provides opportunities to explore alternative ideas facilitate detectable change towards progressive pedagogical beliefs?

Research Methods

Design

This study used a mixed methods approach and a quasi-experimental one group pretest-posttest (Campbell & Stanley, 1963) research design. Pre- and post-pedagogical surveys were analyzed using a paired samples t-test. Content analysis using an a priori coding scheme (Stelmer, 2001) was used to examine student written personal educational philosophies pre- and post-course.

Sample

Participants in this study were 25 students who had been accepted into graduate programs in instructional design or teacher education and who were enrolled in a mandatory three-credit
The focus of the course was on learning theory; instructional philosophy; practice/application of learning theory; technology operations and concepts; integration and evaluation of technology-based learning products; literature research; and learner centered approaches that focus on awareness of and the ability to use technology as a learning tool. Students in the course had varied major areas of concentrations, including elementary education, mathematics, science, social studies, language arts, and foreign languages, in addition to instructional design. Of 35 students enrolled in the course 25 agreed to be part of the study. Of these 25, complete data were available for 22 on the survey and 21 on the personal educational philosophy papers.

Procedures

Survey
On the first and last day of class, participants were asked to complete the Teacher’s Survey: Combined Versions 1-4 Part J (Becker & Anderson, 1998). Part J of the survey is aimed at identifying pedagogical beliefs.

Personal educational philosophies and intentional reflection on pedagogical beliefs
The first day of class, participants were asked to reflect upon their personal teaching and learning philosophies and to explicitly described their concept of the nature of knowing, learning, teaching, the role of a teacher, the role of a student, curriculum, the ideal learning environment, and how one can tell if learning has happened. These ideas comprised their personal educational philosophies. Once developed, they shared their initial philosophies with each other and then were asked to make revisions to their philosophies if listening to their peers had sparked some ideas and they felt their philosophy needed revision. Ongoing throughout the course, students were asked to keep reflective journals in which they identified assumptions that they’d held about teaching and learning that they might be questioning or that they would like to
further explore. This allowed students to set personal goals for exploring concepts related to pedagogical beliefs. This explicit examination of pedagogical beliefs was ongoing throughout the course as students were asked to revised their pedagogical beliefs as needed, examine and evaluate their learning processes, reflected on the outcomes of their learning, and identified pedagogical beliefs that may warrant either change or further investigation, set goals for themselves, and examine the outcomes of those goals. The students worked through this process as various learning theories and instructional models were introduced and explored. Time was built into each weekly meeting for students to discuss, collaborate, share and socially negotiate the viability of their personal pedagogical beliefs. At the end of the course, participants were asked to revisit and revise their personal teaching and learning philosophy.

Progressive Classroom Activities. Drawing on progressive ideology, all activities in the class were designed to situate participants in learning experiences that would model progressive methods. All learning activities were developed with five attributes of “meaningful learning” in mind as defined (Jonassen et al., 1999):

- Active (Manipulation/Observant): Participants “actively [manipulate] the objects and tools of the trade and [observe] the effects of what they have done” (Jonassen et al., 1999).
- Constructive (Articulative/Reflective): Participants construct meaning by reflecting on the process and articulating their experiences and conceptual understandings.
- Intentional (Reflective/Regulatory): Participants engage in intentional learning while trying to achieve a cognitive goal, reflecting, evaluating, and articulating the process and the “decisions they make, strategies they use, and the answers they found” (Jonassen et al., 1999).
• Authentic (Complex/Contextual): Participants engage in learning activities that are complex and contextual.

• Cooperative (Collaborative/Conversational): Participants engage in collaborative activities during which they dialog about a task, the methods they will use to accomplish the task, as well as seeking out alternative ideas and opinions.

An example of a learning activity that met this criteria was asking the participants to explore and understand web-based inquiry by creating a web-based inquiry or WebQuest (Dodge, 1995), and engaging them in the learning of the concept by having them complete an instructor created WebQuest about WebQuests [url available upon request—removed for anonymity]. By actively engaging in a WebQuest which explored the critical components of web-based inquiry, participants were able to form and revise their constructs of web-based inquiry collaboratively and further articulate their learning by creating their own WebQuest. This framework allowed for active exploration of concepts and the acquisition of instruction and technology skills within the context of using and applying them so that students both explored learning strategies and the use of technology to support learning and did so while self-regulating and working cooperatively in groups.

Materials

Items were used from the Teacher’s Survey: Combined Versions 1-4 Part J (Becker & Anderson, 1998). The instrument uses self-reporting to derive epistemological beliefs and characterizes them on a scale that goes from transmissive-oriented to progressive-oriented instruction. The idea behind the survey is that asking teachers about their beliefs with respect to teaching and learning will reveal their underlying philosophy. Validity for the survey was
measured by comparing survey results with coded observation data, respondent interviews, and artifacts like quizzes and assignments. Historically, the reliability of this scale has been strong, with an alpha of 0.83 (Ravitz, Becker, & Wong, 2000). It should be noted that reliability and validity of these items was assessed using in-service teachers, which does not match up with the population of pre-service teachers.

Results

Pre- and Post-Pedagogical Survey

As noted above, 3 of the 25 students failed to respond to a total of four questions. The decision was made to not use mean replacement but instead drop these three participants from the analysis. Given that these items were used with a new population (pre-service as opposed to in-service teachers), a reliability analysis was run on the items using Cronbach’s alpha. The resulting alpha of 0.45 is rather disappointing, suggesting that, at least for these particular pre-service teachers, the items are not very consistent in their measurement of pedagogical beliefs. Despite this low reliability, the decision was made to use the items as they were originally designed. Responses from 19 variables were aggregated into a single variable measuring teaching philosophy. Possible scores ranged from 19 (transmissive) to 102 (progressive). Note that a score of 60 or 61 would place a respondent around the halfway point on the scale. Table 1 shows the means and standard deviations for the pre-survey and post-survey.

To examine differences between the pre and post survey, a paired samples T test was run with an alpha level of .05. The expectation was that students would be more progressive in their philosophy after the course of a semester, justifying the use of a one-tailed test. The results, \( t(22) = 3.68, p < 0.01 \) show that students were more progressive in their philosophies after the
semester at a statistically significant level. The effect size for this difference is also large ($d = .82$), as computed using the control group or pre-survey standard deviation. In terms of practical significance, the story is less dramatic. The mean difference between the groups is 4.1, which means only four increments towards the progressive end of the scale. Given that there are a total of 83 increments in the scale, this is a small change. The importance of these differences will be elaborated on in the discussion.

**Pre- and Post-Educational Philosophies**

A initial framework for conducting a content analysis on participants’ educational philosophies was developed a priori (Weber, 1990) using an amalgamation of existing work (Baylor, Kitsantas, & Hu, 2003; Brooks & Brooks, 1999; Grabe & Grabe, 2001; Jonassen et al., 1999; Ravitz, Becker, & Wong, 2000; Witcher et al., 2001). Statements within the philosophy were coded as either transmissive or progressive. The ratio of progressive statements to total statements was used to automatically generate a summary code with the following thresholds: transmissive is less than or equal to .4; eclectic is less than or equal to .6; progressive is greater than .6. This follows the proportion established by Witcher et al. (2001).

Using the initial framework the authors independently coded nine of the pre-educational philosophies (Table 2, Coding 1) and then compared their coding to check reliability using Cohen’s Kappa (Stemler, 2001). Revisions to the initial framework were made based on the analysis of the participants’ texts and a revised framework was created. At that time the rules for coding were developed and instances were identified in the text and used to exemplify the rules (Appendix B) (Mayring, 2000; Silverman, 2000).

Using the revised framework and rules, the authors added the remaining twelve pre-philosophies to the first nine and then independently recoded all twenty-one and checked reliability (Table 2, Coding 2). Slight modifications were made to the framework (Appendix A)
and rules six and seven were added (Appendix B). The authors coded the all twenty-one post-philosophies (Table 2, Coding 3) and again checked reliability with a resulting Kappa of .63, referred to as substantial by Stemler (2001).

Once all the pre- and post-philosophies were coded, the frequency of progressive and transmissive statements were added across both raters and used to generate a summary ratio using the same thresholds described above. The resulting pre- and post frequencies are reported in Table 5. These pre- and post- philosophy differences were analyzed using a Chi-square \(^2(4, N = 21) = .69, p = .71\). These results indicate no statistically significant change in pedagogical beliefs.

**Discussion**

As noted in the review of literature, students in the study have been developing their philosophy about teaching over the course of much of their own educational career and throughout their lives. Initial data from the survey seems to indicate that restructuring a class so that participants are embedded in a progressive learning environment that fosters intentional reflection in beliefs, can effect pedagogical beliefs. However, there are some limitations to the survey. As noted above, the inter-item reliability of the measure is quite poor for this particular sample. This presents a large area of concern because the changes that were found between the pre- and post-surveys may in fact be an artifact of the measure as opposed to real changes in pedagogical beliefs. Given the low reliability, an exploratory factor analysis was attempted in
order to extract components. Unfortunately, the factor loadings failed to meet the minimum criteria of four or more loadings at the .6 level (Stevens, 2002). This should come as no great surprise given that the measure had three constructs at best (transmissive, eclectic and progressive) all of which are points along a single continuum. In order for the effectiveness of the survey to be assessed with pre-service teachers, it should be administered to a larger sample (preferably \( n=300 \)) and analyzed with an exploratory factor analysis. Further, assuming the statistically significant changes were reflective of actual shifts in pedagogical beliefs, it remains that eclectic students were still eclectic at the end of the course.

In contrast to the survey, the pre- and post-philosophies did not show statistically significant changes via chi-square analysis. However, it is important to note that several of the cells fell below the accepted frequency benchmark of five. In addition, there were no occurrences of transmissive oriented students in the post-philosophies, violating a second assumption of chi-square. Despite the lack of statistical significance it is important to note that while there were two cases of students moving from progressive to eclectic, there were three cases of students moving from eclectic to progressive and two cases where students shifted their beliefs from transmissive to progressive—a radical shift if contextualized within the framework of one course over one semester.

The research design presents several threats to validity. Campbell & Stanley (1963) cite history, maturation, testing, instrumentation, and regression as possible threats to internal validity with a one-group pretest-posttest design. Given that the scores on the survey moved away from the mean over time, regression to the mean is not a threat. In terms of the pedagogical beliefs papers, the overwhelming majority of students were progressive, so effects attributed to regression to the mean would actually favor the null hypothesis. It is also unlikely
that maturation played a role given that the participants are adults, and no significant historical events occurred over the course of the semester. Testing may have played a role for the survey given that the same instrument was administered as a pre and post survey but the time between was quite large. It is possible, but unlikely that any event altered participant perception during the course of the study, making historical threats to validity unlikely. Perhaps the most likely threat is related to instrumentation. While the instrument may not have changed, exposure to the class may have changed participant’s understanding of the questions. That is, the observed differences may not be due to a change in participant beliefs, but a change in their ability to articulate, or respond to questions about their beliefs.

Our two sources of data, the survey and coded philosophies contrasted not only in terms finding significant differences, but in terms of how the aligned to the constructs overall. Specifically, the survey identified students as generally eclectic which aligns with Witcher et al. (2001) whereas the coded philosophies identified the majority of students as progressive. In part, these differences may be due to the nature of the skill. Although the survey asks students to articulate their beliefs it is done with a controlled vocabulary, and provides set examples and prompts that may not reflect personal pedagogical beliefs. In contrast, the educational philosophies allowed for more freedom of expression. Based on the educational philosophies, it is clear that students responded to the treatment differently. Future work that focuses on the process of how students examine, reflect, and potentially change their pedagogical beliefs may elaborate on these differences between students and between measures.

The real question seems to be how one’s pedagogical beliefs ultimately transfer into their teaching practice. While there is evidence to support the correlation between beliefs and instructional practices (Harste & Burke, 1977) of practicing teachers, the participants in this
study were not actually engaged in teaching but were pre-service teachers. One’s beliefs are formulated by one’s experiences. The lack of experience with progressive pedagogy as a learner (Florio-Ruane & Lensmire, 1990; Jaffee, 2003; Pajares, 1992, Weber & Mitchell, 1996) and even more critically as a teacher (all participants were pre-service teachers), limits fully developed pedagogical beliefs.

In thinking about the development of values and beliefs, the ultimate goal in teacher education is to align best teaching practices and pedagogical beliefs so that there is transfer into the classroom. The participants in this study, however, were asked to describe, develop, discuss, examine, and explore their own pedagogical beliefs as they developed their learning philosophies as well as respond to a variety of pedagogical beliefs and instructional models on a survey however, they were not asked to move beyond the level of responding or valuing, relatively low level categories if one thinks about the affective domain. Krathwohl, Bloom, & Masia (1964) theorized the development of values and beliefs is along a continuum and developed a taxonomy ordered according to the principle of internalization. According to this theory, beliefs are not fully internalized until those values and beliefs are evident in actions. In the context of this study that would mean a match between espoused pedagogical beliefs and teaching practices.

Participants in this study were asked to respond to questions aimed at identifying their pedagogical beliefs. Essentially they were asked to do little more than respond and in some cases place a value on pedagogical ideology and methods. Research suggests that despite the efforts of teacher education institutions, the latent effects of acculturation into transmissive paradigms as students persist and are evident in teaching practices (Lacey, 1977; Tabachnick & Zeichner, 1984). Although it is encouraging that the intervention was able to affect some pedagogical belief changes, however modest, the important work that remains is determining how well these
belief changes translate into progressive teaching practices. In the framework of Krathwohl et al. (1964), it remains to be seen if teacher education students exhibit their changed beliefs beyond the level of responding to vignettes on a survey or articulating beliefs that are removed from practice. In short, further study is needed on whether or not students transitioning to professional life will explain, advocate for, and exemplify their beliefs within a school culture. Thus, a longitudinal approach that both examines pedagogical beliefs and practice as well as sustainability of constructivist beliefs and practices in K-12 classrooms is the next logical step in this line of research.
References


## Appendix A

### Final Framework for Content Analysis of Participants’ Philosophies

<table>
<thead>
<tr>
<th>Category</th>
<th>Transmissive</th>
<th>Progressive</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>What is learning?</strong></td>
<td>• Reading, listening, and receiving explanations directly.</td>
<td>• Actively working and applying ideas in a social context.</td>
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<td></td>
<td>• Content or facts learned.</td>
<td>• Develop the whole child, emphasize social problems &amp; themes, and values that emerge from social experience.</td>
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<td></td>
<td>• Intellectual, development of the mind, learning cultural heritage and to transmit permanent values.</td>
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<tr>
<td><strong>What facilitates learning?</strong></td>
<td>• Clear and concise presentation of material.</td>
<td>• Mistakes and confusion facilitate learning.</td>
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<td></td>
<td>• Planning a set of activities around particular content.</td>
<td>• Facilitate student-designed efforts.</td>
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<td></td>
<td>• Present new information.</td>
<td>• Elicit student opinions.</td>
</tr>
<tr>
<td></td>
<td>• Identify questions.</td>
<td>• Guide, facilitator, and motivator.</td>
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<td></td>
<td>• Decide how to explore an issue or solve a problem.</td>
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<td></td>
<td>• Teacher is the one who knows, transmits knowledge to the student who does not yet know.</td>
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<td></td>
<td>• Establishes the rules and consequences.</td>
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<tr>
<td><strong>What is the role of the Teacher?</strong></td>
<td>• Passive and reactive. Learns information by absorbing from teacher or other source.</td>
<td>• Actively constructs knowledge by exploring, manipulating, comparing, reflecting, articulating.</td>
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<td></td>
<td>• Answer questions in textbook.</td>
<td>• Self-evaluation.</td>
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<td></td>
<td>• All students begin at the same point.</td>
<td>• Student initiation (active learners)</td>
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<td></td>
<td>• Receive information from the teacher.</td>
<td>• Students have different questions they seek to answer.</td>
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<td></td>
<td>• Passive learner.</td>
<td>• Greater authority to decide content of learning.</td>
</tr>
<tr>
<td><strong>What is the role of the Student?</strong></td>
<td>• Fragmented, simplified, disciplines taught in isolation, focus on breadth, emphasis on literacy and skills. Information delivery. Factual/literal thinking</td>
<td>• Decide how to explore an issue or solve a problem.</td>
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<td></td>
<td>• Teacher determined.</td>
<td>• Articulate their own ideas in concrete context.</td>
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<td></td>
<td>• Academic offerings, liberal arts, sequence and prescribe with emphasis on reading, writing and arithmetic.</td>
<td>• Self-directed, personally responsive.</td>
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<td></td>
<td>• Skills based for use at a later date.</td>
<td>• Interact with Peers.</td>
</tr>
<tr>
<td><strong>What should we teach and who should determine it?</strong></td>
<td>• Relevant, authentic, complex, multidisciplinary, knowledge integration, focus on depth, emphasis on depth and application, inquiry-based. Information exchange. Process driven.</td>
<td>• Make conjectures, explicitly work on issues related to their own experiences and argue various points of view.</td>
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<td>• Student interest, prior experience and current understanding.</td>
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<td>• Content and activities vary within a classroom and from student to student.</td>
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<td>• Focus on thinking evaluating, decision-making and planning and problem-solving.</td>
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<td></td>
<td></td>
<td>• Academic, vocational and practical offerings. Based on needs, experiences and interest.</td>
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<td>• Things of immediate value.</td>
</tr>
</tbody>
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### What is the ideal learning environment?

- Teacher centered, students work independently. Information delivery.
- Does not involve social construction ideas.
- Quiet classroom with few distractions.

### How can we tell when learning has happened?

- External to learner. Measurement of factual knowledge and discreet skills generally at the end of the learning sequence.
- Based on group norms.

### Additional Information

- Collaborative and conversational. Teacher as facilitator. Student centered and driven. Information exchange.
- Systematically created social structures for learning (debates, cooperative group projects).
- Interdependency with other students.
- Project based assessment.
- Individualized criteria.
# Appendix B

## Rules for Using the Framework for Content Analysis of Participants’ Philosophies

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<tr>
<th>#</th>
<th>Rule</th>
<th>Example</th>
</tr>
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| 1. | Some statements may contain separate portions that align to both transmissive and constructivist, code it as one of each. These should be coded as both T and P. | *What facilitates learning?*  
“Requirement for school, work or life functions.” Learning because it’s a requirement for school is transmissive and learning because it is a requirement for work or life functions is progressive. |
| 2. | Some statements may fall into both categories with all elements able to align to both transmissive and progressive perspectives. These should not be coded at all. | *What facilitates learning?*  
“Other people’s stated or implied perceptions of one’s ability to learn.” The central idea here is external opinion. This aligns with transmissive because it gives credence to an external locus of control. This aligns with progressive because it deals with social cognitive factors of learning. |
| 3. | Single code a set of ideas if they are talked about as a whole unit in the rubric below. | *What should we teach and who should determine it?*  
“Certain universal curriculums should be taught to all students including reading, writing, math . . .” This aligns with the “3 Rs (reading, writing, and arithmetic) and should be coded as a single T). |
| 4. | If a statement is not clearly present in the rubric, don’t force a code. | *What should we teach and who should determine it?*  
“A secondary curriculum can include religion, technology skills, physical training, social interaction, vocational skills and philosophical ideologies.” Social interaction and vocational skills align with P and should be coded as such (2 P). Religion, technology skills, physical training, and philosophical ideologies do not explicitly align with either and should not be coded. |
| 5. | Look for moderators to an idea. | *Has learning occurred?*  
“Learned functional skills are easier to validate. An individual can be tested on his or her ability to execute or operate that which was taught.” At first glance this looks like performance outcomes, but the word test is used and it is a measure of what is taught which are both very transmissive, so this should be coded as a single T. |
| 6. | If an idea or concept is attributed to another person and then state the participants states his/her own opinion, only code his/her own opinion. | *What is learning?*  
“General definition: ‘A change in performance or potential as a result of interaction with the world’ (Driscoll 11)  
My general definition: The acquisition of new knowledge and skills.” |
| 7. | If students are a factor in deciding curriculum, then code it as P even if it more transmissive sources for curriculum are included as well (such as teachers, curriculum coordinators, etc . . .) because the students are asked for their insight. | *What should we teach and who should determine it?*  
“Several groups of people should have a say in what is taught: Community, students, parents, teachers, and government groups.” |
Tables and Figures

Table 1 *Results from pre- and post-survey*

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<thead>
<tr>
<th>Treatment</th>
<th>n</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>pre-survey</td>
<td>22</td>
<td>64.9</td>
<td>5.1</td>
</tr>
<tr>
<td>post survey</td>
<td>22</td>
<td>69.1</td>
<td>6.5</td>
</tr>
</tbody>
</table>

Table 2 *Results of Cohen’s Kappa*

<table>
<thead>
<tr>
<th>Coding</th>
<th>Kappa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coding 1</td>
<td>$(n = 9) = .50, p = .13$</td>
</tr>
<tr>
<td>Coding 2</td>
<td>$(n = 21) = .57, p = .001$</td>
</tr>
<tr>
<td>Coding 3</td>
<td>$(N = 42) = .63, p = .001$</td>
</tr>
</tbody>
</table>

Table 3 *Cross Tabulation of Pre- and Post- Philosophies Aggregate Scores*

<table>
<thead>
<tr>
<th>Aggregate Pre</th>
<th>Aggregate Post</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>T</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>0</td>
</tr>
<tr>
<td><strong>Aggregate Post</strong></td>
<td></td>
</tr>
</tbody>
</table>