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Analyzing the Contextual, Motivational, and Conceptual Characteristics of  
Teaching Faculty in Regard to the Use of Learner Centered Approaches to Teaching

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## Analyzing the Contextual, Motivational, and Conceptual Characteristics of Teaching Faculty in Regard to the Use of Learner Centered Approaches to Teaching

### Abstract

The purpose of this national survey was to explain the relationships between professors' contextual characteristics, teaching conceptualizations and motivation, and the use of learner-centered teaching (LCT) methods in colleges of environmental, agricultural, applied, and life sciences. Three hundred and twenty-nine professors from land-grant universities (1862 & 1890) and state colleges participated in the study. Simple linear correlations were computed, and three multiple regression models were conducted to determine if teacher conceptualizations, LCT value motivation, and LCT self-efficacy were collectively related to professors' use of teaching methods for (1) active learning, (2) inquiry learning, and (3) service learning.

Eighty-five percent of professors in the study worked at research institutions, 69% of the respondents were tenured at the time of the survey. Professors had four teaching conceptualizations: developmental, apprenticeship, transmission, and nurturing. Professors were interested, motivated, and confident in their ability regarding the use of teaching methods for active, inquiry, and service learning, yet they used lectures 77% of the time. Professors used teaching methods and approaches for inquiry learning about one-half of the time, active learning about one-third of the time, and service learning about 15% of the time in their courses. The three models were significant. The teaching methods used for learner-centered teaching were related to a teacher's task value motivation, teaching self-efficacy, and conceptualization of teaching. The results suggest that the teaching methods used by professors are informed by their teaching conceptualizations.

### Introduction

Current and past calls to reform in higher education consistently echo that teaching and learning in colleges must be improved as their graduates leave institutions under-prepared and incompetent workers and citizens (Academy of Distinguished Teachers, 2002; Boyer Commission, 1998; Kember, 1997; Scarlett, 2004). In regard to the disciplines of agriculture, food, and natural resources, reform efforts to improve practice challenged colleges nationwide to re-think the *purpose* and *delivery* of professional education (National Research Council, 1992). As recently as five years ago, the Kellogg Commission on the Future of Land Grant Universities called for similar educational reform, indicating that, "unless public colleges and universities become the architects of change, they will become its victims" (1999, p. 1). The political climate in higher education has indicated the need for colleges to re-think, re-shape, and ultimately improve teaching and learning in college classrooms by placing a greater emphasis on the nature of the student experience and effective teaching (Menges, 2001; NASULGC, 2001).

Teaching in college classrooms remains predominately a traditional lecture-based, teacher-directed model of student assimilation and recitation of factual information (Gardiner, 1994). Yet, a body of literature in teaching and learning supports the notion that a learner-centered paradigm for teaching that incorporates student engagement in the learning process is effective. In their report on the *Seven Principles for Good Practice in Undergraduate*

*Education*, Chickering and Gamsun (1987) presented that good practice encourages student-faculty contact and active learning among other factors. More recent adaptations to the report, Ewell and Jones (1996) indicated that a quality curriculum allows for synthesis, application, and integration of education and experience, and that quality instruction further supports a learner-centered paradigm for teaching.

Learner-centered teachers design, facilitate, and guide learning experiences that focus on the needs of the learners and expedite learning (Weimer, 2002). Learner-centered teachers believe the most effective way for students to acquire knowledge is to apply information or instruction to assessing and resolving problems that are common to the student's experience (Robertson, 2005). Each new application forces students to either modify existing knowledge concepts or develop new ones. It is critical for learning to be guided by settings that are relevant to today's real world problems and to the students' lived experiences (Oliver-Hoyo & Allen, 2005; Walczyk & Ramsey, 2003). We defined learner-centered teaching as an approach to classroom teaching and learning that involves the creation of meaning from experience, uses examples grounded in real-life situations, encourages total participation, allows for creativity and discovery in and outside of the classroom, relies on multiple sources of knowledge, and focuses on creating and forming concepts using critical thinking and problem-solving (Knobloch & Ball, n.d.). This definition is grounded on the assumptions of experiential learning (Dewey, 1938; Knobloch, 2003), constructivism (Driscoll, 1994; Prawat & Floden, 1994), cognitive apprenticeship (Collins, 1991), authentic learning (Newmann & Associates, 1996; Wehlage et al., 1996), and learner-centered teaching (Weimer, 2002).

Active learning, inquiry learning, and service learning approaches are three common approaches to teaching and learning which support the assumptions of a learner-centered paradigm and have demonstrated student benefits in the learning process. Bonwell and Eison (1991) defined *active learning* as strategies that involve students in the classroom and challenge them to think about the activities that they are doing. Cooperative learning and experiential learning are two of the many methods whereby faculty attempt to actively engage students in the learning process (Johnson, Johnson, & Smith, 1998). Research on active learning methods indicates that students experience both cognitive and affective gains in learning when they are actively engaged in the process (Faust & Paulson, 1998; Springer, Stanne, & Donovan, 1997).

*Inquiry learning* is an instructional method by which students use a variation of the scientific method of inquiry as a means to study a problem in depth. The goal is both deeper learning about the focus of the inquiry and the processes of inquiry as a learning method. It is an instructional strategy in which students confront contextualized, ill-structured problems and strive to find meaningful solutions and concepts. Methods such as problem-based learning and discovery learning represent two of the many inquiry-based approaches to teaching and learning. Problem-based learning in particular has been adopted in several professional education programs to develop the skills, abilities, and attitudes in students as inquiring professionals in a discipline. Research on problem-based learning indicates increases in students' abilities to think critically and solve ill-structured problems (Jonassen, 2000).

*Service learning* is a method which engages students to learn and develop through thoughtfully-organized service (Swick, 2001). Service learning meets five conditions: (a) is

conducted in and meets the needs of a community; (b) is coordinated with an institution of higher education and with the community; (c) helps foster civic responsibility; (d) is integrated into and enhances the academic curriculum of the students enrolled; and (e) includes structured time for students to reflect on the service experience (National Service Learning Clearinghouse, n.d.). Service learning approaches to teaching focuses on student understanding of the culture and context in community-based environments outside of the classroom (Astin et al., 2000; Conrad & Hedin, 1995).

Few professors have actually been taught how students learn and how to best teach their students (Academy of Distinguished Teachers, 2002; Murray, 1987; Scarlett, 2004). Whaley and Wickler (1992) found that 39% of the teaching faculty within a College of Agriculture had no prior teaching experiences before their current teaching position. In absence of a solid knowledge of research in the newest teaching strategies or solid training in effective educational practices (Theall, 1999), professors organize and teach their content based on their academic disciplines, personal beliefs and backgrounds (Stark et al., 1988), and conceptualizations of teaching and learning (Pratt, 2001). Professors' teaching conceptualizations are based on assumptions that inform how they teach (Kember, 1997), and they choose teaching methods to achieve their instructional goals (Hativa, 1999).

Motivation plays a major role in professors' willingness to change how they teach or expend more time and energy into teaching (Feldman & Paulsen, 1999). Although most professors have the dual roles of teaching and research, the explicit reward structure in higher education favors research performance (Leslie, 2002). Further, Leslie suggested that this disconnect between the intrinsic and extrinsic rewards in academia poses problems for faculty motivation and performance. Higher education reform has been calling for a paradigmatic shift in teaching from teacher directed to more learner-centered approaches (Abrams, 2003; Gonzales & Nelson, 2005; Ramsden, 1992; Walczyk & Ramsey, 2003). Yet the organizational, conceptual and motivational climate for teaching among university professors have demonstrated to influence how teaching behaviors are viewed by and ultimately delivered in college classrooms. This study was conceptually and theoretically framed on the ways in which contextual, motivational, and conceptual factors explain learner-centered teaching practices of college professors.

### Theoretical Framework

In spite of the expectation to do research, professors can overcome the pressure to "publish or perish" by fostering high levels of motivation and strategically creating opportunities for success (Beard, 1965; Walker & Symons, 1997). Motivation is based on one's expectations and values of completing a certain task (Green, 2002). In regard to faculty motivation, expectancy-value theory and self-efficacy theory have been documented to impact teaching effectiveness. Expectancy-value theory postulates that an individual's choices and performances can be explained by his or her expectancy beliefs and values (Wigfield, 2002). The effort that people are willing to expend on a task is a result of their expected success of the task and the extent to which they value the task or success of the task (Eccles & Wigfield, 2002). Attainment value, intrinsic value, utility value, and cost value are four components of expectancy-value theory (Eccles & Wigfield, 2002). Attainment value is the importance one places on completing

the task. Intrinsic value is the interest and enjoyment regarding the task. Utility value is the usefulness of the task in achieving current and future goals. Cost value is the perceived negative aspects that could result from engaging in the task. Teaching self-efficacy, a type of self-efficacy belief (Bandura, 1986), is “the teacher’s belief in his or her capability to organize and execute courses of action required to successfully accomplish a specific teaching task in a particular context” (Tschannen-Moran et al., 1998, p. 233). Teaching self-efficacy is an important variable in how teachers teach (Tschannen-Moran et al., 1998) and has been especially prominent in educational studies (Pajares, 2001). As such, the expectancy of positive outcomes of teaching as well as the belief that one can accomplish teaching related tasks influence professors’ likelihood to focus time and energy toward teaching related endeavors.

The ways in which faculty view themselves as managers of learning have been found to impact the classroom climate for learning (Pratt & Collins, 2001). A deeper orientation regarding one’s role toward teaching was related to the use of learner-centered strategies in the classroom (Trigwell & Prosser, 1996; Trigwell, Prosser, & Waterhouse, 1999). Thus, the ways in which professors conceptualize their roles as teachers form the final theoretical link to factors that could influence the degree to which faculty members focus efforts on learner-centered approaches to teaching. Teaching perspectives are formed by the conceptual lenses through which educators see themselves as teachers, and have been found to influence the way that teachers teach (Pratt & Collins, 2001). Pratt and Collins (2001) measured teacher conceptualizations through a *Teaching Perspectives Inventory*.

The inventory describes five major perspectives teachers have about the teaching and learning process, including transmission, apprenticeship, developmental, nurturing, and social change. From the transmission perspective, teaching is viewed as delivering content. In the apprenticeship perspective, teaching is viewed as modeling ways of being, especially skilled performance of knowledge as it is applied in a professional context. In the developmental perspective, teaching is viewed as cultivating ways of thinking and develop more sophisticated ways of reasoning and problem solving about a body of knowledge. In the nurturing perspective, teaching is viewed as facilitating personal agency, especially self-confidence and self-motivation of learners. Finally, in the social change perspective, teaching is viewed as seeking a better society and shaping societal ideals. Teaching perspectives in general are philosophical orientations neither good or bad, and good teaching and poor teaching can be viewed in each of the five perspectives, a teacher’s perspective on the outcomes of teaching and how learning occurs shapes the teaching methods they use (Pratt, 1998; Pratt & Nesbit, 2000). For the purpose of this study, the researchers measured teaching conceptualizations using the *Teaching Perspectives Inventory*. Therefore, teaching perspectives and teaching conceptualizations were used interchangeably.

Professor motivation as well as conceptualizations of teaching must be viewed in light of the context in which faculty conduct their work. The nature of faculty work includes balancing the pressures of teaching, conducting research, and accruing academic tenure or promotions (Boyer, 1990; Scarlett, 2004). The research university, in particular creates a “paradox that superior faculty results in an inferior concern for undergraduate teaching” (Kerr, 2001, p. 49), that could undermine the importance faculty place on effective teaching practice. Because the context variables of type of institution, academic rank, and the nature of the tenure system itself

has been found to influence reward systems at many universities and impact teaching effectiveness (Scarlett, 2004), it stands to reason that learner-centered teaching practice would be influenced by such context variables as well.

Because teachers are the single most important variable on student achievement (Darling-Hammond, 1997), the professor plays an important role in students' learning experiences. Professors are expected to be scholars in their disciplines, but not necessarily scholars of teaching and learning. As such, professors' views of teaching and learning and motivation to be learner-centered influence the teaching methods they use to teach college students, and could likely serve as a great barrier to the widespread implementation of learner-centered teaching in college classrooms. A number of research studies support the effectiveness of learner-centered teaching approaches such as active (e.g., Faust & Paulson, 1998), inquiry (e.g., Jonnassen, 2000), and service learning (e.g., Astin et al., 2000). Yet little research exists that explains the connection between the type of institution, rank, how professors view teaching and learning, their motivation for teaching, and their use of learner-centered approaches in college classrooms (Walczyk & Ramsey, 2003).

### Purpose and Research Questions

The purpose of this descriptive study was to explain the relationships between type of institution, professors' teaching conceptualizations and motivation, and the use of learner-centered teaching (LCT) methods in colleges of environmental, agricultural, applied, and life sciences. The research questions for this study were: (1) What were the types of institutions, and professors' conceptualizations of teaching, task value motivation of LCT, and LCT self-efficacy? (2) To what extent do professors use LCT approaches? (3) What are the relationships between types of institutions, professors' conceptualizations of teaching, task value motivation of LCT, and LCT self-efficacy and LCT approaches used (active learning, inquiry learning, service learning)? (4) Are professors' use of teaching methods for active learning collectively related to the type of institution, apprenticeship and developmental teaching conceptualizations, LCT task value motivation, and LCT teaching self-efficacy? (5) Are professors' use of teaching methods for inquiry learning collectively related to the type of institution, apprenticeship and developmental teaching conceptualizations, LCT task value motivation, and LCT teaching self-efficacy? (6) Are professors' use of teaching methods for service learning collectively related to the type of institution, nurturing and social change teaching conceptualizations, LCT task value motivation, and LCT teaching self-efficacy?

### Methods and Data Sources

This study was a national status survey. The target population was teaching faculty in environmental, agricultural, applied and life sciences in higher education. A random cluster sample of 1553 teaching faculty nationwide from a total of 19 land grant universities (1862 & 1890) as well as state colleges participated in the study. Data were collected based on Dillman's (2000) tailored design method using a web-based questionnaire. The survey was conducted in May, 2004, which yielded 329 responses for a 20% response rate. A comparison of early to late respondents was utilized to control for non-response error, and no significant differences were noted between the two groups.

Sixty-nine percent of the respondents were tenured, 25% were in the tenure track but had not accrued tenure at the time of the study, and the remaining 6% were in non-tenure track appointments. Three percent of respondents were appointed as lecturers or academic professionals, 25% were assistant professors, 27% were associate professors, 42% were appointed at full professor status, and the rest were appointed in administrative positions. There were 221 of the professors were male (74%) and 78 were female (26%).

The web-based questionnaire consisted of three parts including: (1) faculty conceptualizations of teaching and learning, (2) faculty motivation regarding learner-centered approaches to teaching, (3) the actual teaching methods and approaches that faculty implemented in the classroom, and (4) demographic information. For Part 1, the faculty conceptualizations construct of the instrument consisted of 25 items adapted from Pratt and Collins' (2001) *Teaching Perspectives Inventory*. Some sample items that measured teaching conceptualizations were: "To be an effective teacher, one must be an effective practitioner" (apprenticeship); "Teaching should build upon what students already know" (developmental); "In my teaching, building self-confidence in learners is a priority" (nurturing); "My teaching focuses on societal change, not the individual learner" (social change).

For Part 2, the faculty motivation construct on the instrument consisted of 24 items, which were created by the researchers based upon expectancy-value and teaching self-efficacy theories. Thirteen task value items were created based on Eccles and Wigfield's (2002) task value factors. Some sample task value items were: "Learner-centered teaching approaches would engage my students to think critically. Learner-centered teaching approaches provide students with experiences they will encounter in their careers. Learner-centered teaching approaches would motivate my students to learn." The task value items were analyzed for intrinsic and utility factors. Eight of the 13 items explained 39% of the variance and were used for the task value motivation factor.

Eleven teaching self-efficacy items were adapted from the Teaching Self-Efficacy Scale (Tschannen-Moran & Woolfolk Hoy, 2001). Three sample items that measured LCT self-efficacy were: How well can you facilitate groups in your teaching? How well can you develop learner-centered activities that engage students? How well can you adjust your teaching to be more learner-centered? For Part 3, the teaching methods and approaches section of the instrument consisted of 13 items as adapted from McKeachie (2002). Universities were identified as research or non-research universities based on the Carnegie Classification of Institutions in Higher Education (Carnegie Foundation for the Advancement of Teaching, 2006). The Carnegie Foundation considers doctoral-granting institutions having a research focus.

Professors were asked to respond to each statement regarding their teaching conceptualizations and task value motivation using a 4-point summated rating scale: Strongly Disagree (SD = 1), Disagree (D = 2), Agree (A = 3), and Strongly Agree (SA = 4). The teaching self-efficacy was measured using a 5-point summated rating scale: (1) Nothing/Not All, (2) Very Little, (3) Some, (4) Quite a Bit, (5) Great Deal. The scale for teaching methods and approaches was: (1) Not at all, (2) Very Little, (3) Some, (4) Quite a Bit, (5) Always.

The questionnaire was reviewed by a panel of experts and was field- and pilot-tested at four universities not included in the sample. Post-hoc reliability analyses were conducted with the sample, and the following Cronbach's alpha levels were reported: (1) the five constructs for teacher conceptualizations including apprenticeship = 0.62, developmental = 0.80, nurturing = 0.76, and societal change = 0.68, (2) the two constructs for faculty motivation included task value motivation = 0.76 and teaching self-efficacy motivation = 0.83, and (3) the two teaching methods and approaches domains included active learning = 0.75 and inquiry learning = 0.63.

The data set was analyzed using SPSS. Incomplete responses were excluded automatically by SPSS. Negatively worded items were reverse-coded prior to analyzing the data. Summated means and standard deviations were calculated for the composite scores of teacher conceptualizations, task value motivation, LCT self-efficacy, active learning methods, inquiry learning methods, and service learning methods. Factor analysis was used to confirm the teaching methods used for each of the three learning approaches. Conceptually, the researchers viewed active, inquiry, and service learning as three distinctly different learning approaches that professors use to organize learner-centered courses. Active learning included three teaching methods (student presentations, team projects, cooperative learning), which explained 66% of the variance. Inquiry learning included three teaching methods (problem-based learning, case studies, simulations), which explained 58% of the variance. Service learning was one item (Community-based service learning - volunteerism is linked directly to course curriculum). Correlational-regression statistics were used to analyze the data sample. Exploratory multiple linear regression statistics were used to analyze the data. When multicollinearity existed, selected variables were excluded and the models were re-run. Relationships were described using Davis' (1971) conventions. The alpha level was established *a priori* at .05. Effect sizes were computed and interpreted using Cohen's (1988)  $r^2$  coefficient and index.

### Results and Conclusions

For Research Question 1, 15% of respondents worked in non-research institutions while 85% were employed in either research intensive or research extensive universities. The professors agreed that they had developmental ( $M = 3.36$ ;  $SD = .45$ ), apprenticeship ( $M = 3.27$ ;  $SD = .50$ ), transmission ( $M = 3.26$ ;  $SD = .45$ ), and nurturing ( $M = 2.92$ ;  $SD = .58$ ) teaching conceptualizations. The professors did not agree with having a social change teaching conceptualization ( $M = 2.33$ ,  $SD = .63$ ). The professors were interested in and motivated to use learner-centered teaching methods ( $M = 3.03$ ;  $SD = .58$ ). The professors were somewhat efficacious using learner-centered teaching methods ( $M = 3.48$ ;  $SD = .55$ ).

For Research Question 2, the professors used teaching methods for active learning "some" of the time in their instruction ( $M = 3.15$ ,  $SD = .88$ ). One-third of the professors (32%) used cooperative learning quite-a-bit and always (Table 1). One-third of the professors (34%) used team projects outside of class quite-a-bit and always. Nearly half of the professors (45%) used student presentations quite-a-bit and always.

	Not at All		Very Little		Some		Quite a Bit		Always	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Cooperative Learning	30	9.2	63	19.3	128	39.1	85	26.0	21	6.4
Team Projects	33	10.2	52	16.0	130	40.0	74	22.8	36	11.1
Student Presentations	23	7.0	40	12.2	118	35.9	99	30.1	49	14.9

The professors used teaching methods for inquiry learning “some” of the time in their instruction ( $M = 3.11$ ,  $SD = 0.74$ ). More than half of the professors (53%) used problem-based learning quite-a-bit and always (Table 2). More than one-third of the professors (36%) used cases quite-a-bit and always. One-fourth of the professors (26%) used simulations quite-a-bit and always. The professors used community-based service learning “very little” of the time in their courses ( $M = 1.78$ ,  $SD = 1.04$ ). Fifteen percent of the professors used community-based service learning quite-a-bit and always in their courses.

	Not at All		Very Little		Some		Quite a Bit		Always	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Problem-Based Learning	3	0.9	28	8.6	122	37.5	141	43.4	31	9.5
Cases	27	8.3	57	17.5	125	38.3	99	30.4	18	5.5
Simulations	47	14.4	81	24.8	114	34.9	75	22.7	10	3.1

For Research Question 3, simple linear correlations were computed between one contextual variable (type of institution), five teaching conceptualizations, and two motivation variables, and the three LCT approaches (Table 3). Ten associations had medium or large effect sizes. Three teaching conceptualizations (developmental, nurturing, social change) and task value motivation had moderate associations to active learning. Task value and self-efficacy motivation had moderate associations to inquiry learning. Social change and task value motivation had moderate associations to service learning. Self-efficacy had substantial associations to active learning and service learning.

Table 3.  
*Relationships of Independent Variables and LCT Approaches (n = 329)*

	X <sup>1</sup>	X <sup>2</sup>	X <sup>3</sup>	X <sup>4</sup>	X <sup>5</sup>	X <sup>6</sup>	X <sup>7</sup>	X <sup>8</sup>	Y <sup>1</sup>	Y <sup>2</sup>	Y <sup>3</sup>
X <sup>1</sup> : Institution	-	.15	-.02	-.10	-.11	.09	-.07	-.08	-.12	.03	-.12
X <sup>2</sup> : Transmission		-	.43	.05	.21	.33	-.10	.05	-.07	.10	-.20
X <sup>3</sup> : Apprenticeship			-	.35	.43	.49	.17	.30	.20	.22	.16
X <sup>4</sup> : Developmental				-	.50	.35	.31	.35	<b>.33</b>	.18	.17
X <sup>5</sup> : Nurturing					-	.56	.42	.41	<b>.43</b>	.13	.27
X <sup>6</sup> : Social Change						-	.38	.32	<b>.37</b>	.12	<b>.31</b>
X <sup>7</sup> : Task Value							-	.44	<b>.38</b>	.04	<b>.33</b>
X <sup>8</sup> : Self-Efficacy								-	<b>.56</b>	<b>.42</b>	<b>.53</b>
Y <sup>1</sup> : Active Learning									-	<b>.38</b>	<b>.49</b>
Y <sup>2</sup> : Inquiry Learning										-	.27
Y <sup>3</sup> : Service Learning											-

Note. Relationships with medium and large effect sizes were boldfaced.

For Research Question 4, one contextual variable (type of institution), two teaching conceptualizations (apprenticeship, developmental), LCT value motivation, and LCT self-efficacy were regressed on teaching methods used for active learning. The model was significant and all independent variables were significant except the apprenticeship teaching conceptualization. Collectively, type of institution, developmental teaching conceptualization, LCT value motivation, and LCT self-efficacy were significant and explained 35% of the variance of teaching methods used for active learning (Table 4). This relationship had a large effect size.

Table 4.  
*Summary of Regression Analysis for Variables Explaining Teaching Methods for Active Learning (n = 329)*

Variable	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
Type of Institution <sup>1</sup>	-.26	.11	-.11	-2.33	.02
Apprenticeship <sup>2</sup>	-.08	.09	-.05	-.91	.36
Developmental <sup>2</sup>	.32	.11	.17	3.05	.01
LCT Task Value Motivation <sup>3</sup>	.20	.08	.13	2.62	.01
LCT Self-Efficacy <sup>4</sup>	.70	.08	.44	8.41	<.01
(Constant)	-.45				

Note. Full Model:  $R^2 = .36$ ; Adjusted  $R^2 = .35$ ;  $F = 35.29$ ;  $p = <.001$

<sup>1</sup>Type of Institution: 0 = Baccalaureate or Masters University; 1 = Doctoral/Research University

<sup>2 & 3</sup>Teaching Conceptualization & Task Value Motivation scales: 1 = Strongly Disagree; 2 = Disagree; 3 = Agree; 4 = Strongly Agree

<sup>4</sup>LCT Self-Efficacy scale: 1 = Nothing/not all; 2 = Very little; 3 = Some; 4 = Quite a bit; 5 = A great deal

For Research Question 5, one contextual variable (type of institution), two teaching conceptualizations (apprenticeship, developmental), LCT value motivation, and LCT self-efficacy were regressed on teaching methods used for inquiry learning. The model was significant and two of the five independent variables were significant. Collectively, LCT value motivation and LCT self-efficacy were significant and explained 20% of the variance of teaching methods used for inquiry learning (Table 5). This relationship had a large effect size.

Variable	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>P</i>
Type of Institution <sup>1</sup>	.12	.11	.06	1.12	.26
Apprenticeship <sup>2</sup>	.13	.09	.09	1.48	.14
Developmental <sup>2</sup>	.04	.10	.03	.44	.66
LCT Task Value Motivation <sup>3</sup>	-.24	.07	-.19	-3.33	.01
LCT Self-Efficacy <sup>4</sup>	.63	.08	.47	8.07	<.01
(Constant)	1.00				

Note. Full Model:  $R^2 = .22$ ; Adjusted  $R^2 = .20$ ;  $F = 17.27$ ;  $p = <.001$

For Research Question 6, one contextual variable (type of institution), one teaching conceptualization (social change), LCT value motivation, and LCT self-efficacy were regressed on community-based service learning. The model was significant and two of the four independent variables were significant. Collectively, social change teaching conceptualization and LCT self-efficacy were significant and explained 30% of the variance of teaching methods used for service learning (Table 6). This relationship had a large effect size.

Variable	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>P</i>
Type of Institution <sup>1</sup>	-.22	.14	-.07	-1.63	.11
Social change <sup>2</sup>	.20	.09	0.12	2.33	.02
LCT Task Value Motivation <sup>3</sup>	.14	.10	.08	1.42	.16
LCT Self-Efficacy <sup>4</sup>	.83	0.10	0.45	8.35	<.01
(Constant)	-1.81				

Note. Full Model:  $R^2 = .31$ ; Adjusted  $R^2 = .30$ ;  $F = 34.74$ ;  $p = <.001$

## Conclusions, Implications and Recommendations

Professors in the environmental, agricultural, applied and life sciences had developmental, apprenticeship, transmission, and nurturing teaching conceptualizations. It is interesting to note that professors appear to think about teaching and learning in ways that are conducive to learner-centered teaching. Furthermore, the professors were interested, motivated, and confident in their abilities to use LCT methods and approaches in their courses. Professors reported that they used teaching methods and approaches for inquiry learning and active learning some of the time, and service learning very little in their courses. This may suggest four implications.

First, faculty who participated in this study may have been interested in teaching and learning. To assess this limitation, further analysis should be conducted to determine if tenure and type of appointment (research or teaching) was related to type of teaching methods used by professors. Second, the practical nature of the disciplines in agriculture, food and natural resources may influence faculty to use teaching methods that promote inquiry learning. Further inquiry should investigate the influence of academic disciplines on teaching methods (Stark et al., 1988). Comparisons with faculty in colleges (e.g., liberal arts and sciences, education, business, and engineering) should also be conducted. Third, although professors were motivated to utilize and were confident in their abilities to utilize learner-centered teaching approaches, teaching and learning in higher education institutions across the nation continues to envelop a traditional, teacher-driven paradigm (Gardiner, 1994). Perhaps faculty members respond more positively to survey questions regarding the use of learner-centered practices, more than they actually implement such approaches into their actual teaching practice (Feldman, 1989). In either case, it was evident that professors reported using a variety of teaching methods in their courses. Further research is warranted to investigate the discrepancies between faculty conceptualizations and beliefs about teaching and learning and the actual teaching practice of faculty members. In addition, further research is warranted to investigate the impact of faculty development models for learner-centered teaching on professors' use of learner-centered teaching methods. Fourth, although faculty were provided definitions of active, inquiry, and service learning, they may have interpreted these terms from their own teaching experiences rather than understanding the definitions and assumptions informing each of the three approaches. For example, half of the faculty identified using problem-based learning quite-a-bit and always. The faculty probably taught using "problems" to help students apply and learn the content, but they may not have been using the problem-based learning approach grounded on constructivist assumptions that engage students to inquire into an ill-structured problem that sustains interest and learning for several weeks.

Type of institution was not a significant variable in the regression analysis as well as in explaining the variance associated with learner centered teaching approaches utilized by teaching faculty. It is difficult for one to conclude, however that context variables do not matter in regard to teaching approaches because 85% of the participants in the study were from research institutions, and thus lack of variance in the sample could have contributed to the results. It is recommended that contextual and institutional variables should be looked at to determine the role of type of institution, tenure, academic disciplines, gender, and type of position in the model.

Teaching conceptualizations and professors' motivation explained the extent they used learner-centered teaching methods in their courses. Professors who use teaching methods for active learning are more likely to have a developmental teaching conceptualization, see the value of using LCT methods, and be confident in their ability to teach using LCT methods. According to the *Teaching Perspectives Inventory* (Pratt & Collins, 2001), teachers who conceptualize teaching from a developmental orientation, seek to develop higher level cognitive abilities in students. The findings from this study imply that professors who utilize active learning approaches in classrooms seek to develop student thinking. It is recommended that faculty development efforts in active learning focus on ways to implement cognitive processing in college teaching. Further research should be conducted regarding the impact of specific active learning techniques on students' cognitive processing abilities.

Professors who use teaching methods for inquiry learning are likely to see the value of using LCT methods, and be confident in their ability to teach using LCT methods. It is also important to note that while not statistically significant; the teaching perspective of apprenticeship was nearly significant in the model. The teaching perspective of apprenticeship focuses on developing reflective practitioners in professional contexts (Pratt & Collins, 2001). The findings from this study could imply that either inquiry approaches to teaching require a great deal of teacher self-confidence and motivation to implement; or perhaps the professors in this study did not fully understand the definition and/or methods of inquiry approaches. Professors who utilize problems in their courses might think that they are utilizing inquiry learning, when they are in fact implementing a more teacher directed problem-solution approach. Further research is warranted regarding professor knowledge and beliefs regarding inquire learning.

Finally, professors who use community-based service learning in their courses are more likely to have a social change teaching conceptualization and be confident in their ability to teach using LCT methods. The teaching perspective of social change focuses on changing society. Professors who conceptualize teaching through social change focus on engaging students to understand the needs of society and act to make changes. This perspective is closely aligned with service learning and fostering civic responsibility (National Service Learning Clearinghouse, n.d.), and developing student understanding of the culture and context in community-based environments outside of the classroom (Astin et al., 2000; Conrad & Hedin, 1995). Perhaps service learning is not being used by professors in colleges of agriculture, food, and natural resources because professors do not have a social change perspective of teaching. Service learning models should be adapted to allow professors with other teaching perspectives to adopt this approach to learning.

The findings from this study supported previous studies that professors' teaching conceptualizations inform teaching behaviors and practices (Kember, 1997; Pratt, 2001). The alignment of teaching conceptualizations with learner-centered teaching methods supports Hativa's (1999) finding that professors use teaching methods that will help them reach intended outcomes. Furthermore, the teaching methods used will influence the students' learning experiences (Trigwell, Prosser, & Waterhouse, 1999). The findings from this study suggest that the way faculty *think* and *feel* about teaching is likely going to influence what they *do* in their

courses. Faculty developers should create programs that seek to understand professors' conceptualizations of teaching, as well as their motivational beliefs.

Furthermore, professor motivation played an important role in the professors' use of learner-centered teaching methods. This supported Feldman and Paulsen's (1999) assertion that professors will spend the time and energy using alternative teaching methods if they are intrinsically motivated and see the benefits. Task value (Eccles & Wigfield, 2002) and teaching self-efficacy (Bandura, 1997; Tschannen-Moran et al., 1998) are two types of motivation that underpin professors' teaching decisions and behaviors. Teacher development programs should focus on helping professors understand the assumptions of using various teaching methods and the learning benefits of the teaching methods. Graduate students and professors should be provided assistance to help them develop confidence in their abilities to teaching using learner-centered teaching methods. Because of the level of interest in learner-centered teaching, professors in colleges of agriculture, food, and natural resources may be responding to the reform efforts to re-think the *purpose* and *delivery* of professional education (National Research Council, 1992). Perhaps faculty in colleges of agriculture, food, and natural resources are committed to the dual roles of teaching and research. Further inquiry should use structural equation modeling to provide an integrated model of teaching conceptualizations and teaching motivation.

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