Instructional Strategy Use of Faculty in Career and Technical Education

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ABSTRACT

Despite the need to provide differentiated instruction to diverse learners in contemporary CTE programs across institutes of higher education, little research has explored the actual classroom instructional strategies employed in postsecondary settings. To that end, this study found 387 CTE faculty most frequently use interactive lecture, questioning, whole-group discussion, and guided practice in their courses. While, the most infrequently used instructional strategies for CTE faculty included question and answer methods using clickers, synchronous online lecture, video creation, student-generated examinations and quizzes, and reflective blogs. As such, recommendations are articulated for both novice and experienced CTE doctoral students, faculty, and instructors regarding alternative pedagogies they might consider when teaching CTE courses.

Introduction

Students in institutes of higher education widely vary by age, cultural background, disability, gender, ideology, linguistic difference, origin, racial and ethnic identity, religion, sexuality, and social class, which lead to culturally diverse classrooms across the nation. Given the demographic diversity of the 21st century classroom, it is critically important that faculty have the knowledge, skills, and dispositions to meet the learning needs of *all* students regardless of background. Moreover, teacher educators have added responsibilities of modeling effective teaching practices to their prospective teachers. In regard to the roles and responsibilities of teacher educators, Hite, Fletcher, Bruening, Durr, Yontz, Zatezalo et al. (2009) pointed out:

> Not only do education faculty have to understand and convey their content, and know and use effective teaching methods, they also have to be able to explicitly explain and reflect on their own teaching so that teacher candidates are able to see the instructional decisions and productive reflection that must continually take place. (p. 86)

In fact, for the 2007-08 academic year, 41% of the student body across the nation in K-12 public schools were students of color (Ingersoll & May, 2011). However, faculty are not as heterogeneous as their student body. Similar to teacher educators in other disciplines, career and technical education (CTE) teacher educators were 90% White, 6% Asian American, 4% African American, 3% Hispanic, 1.1% Pacific Islander, 1% Native American, and 3% did not indicate their race/ethnicity (Bruening, Scanlon, Hodes, Dhital, Shao, & Liu, 2001). This gap between the backgrounds and cultural experiences of faculty and their students creates a cultural mismatch and oftentimes is considered to be a primary factor in the exacerbation of the existing academic achievement gap, particularly between White and African American students. Research has revealed that teacher educators oftentimes express concern for effectively addressing diversity in

their higher education classrooms, which is problematic given that these individuals are to serve as role models for teacher candidates who will be charged with the task of developing culturally responsive and differentiated teaching strategies for their diverse K-12 students (McHatton, Keller, Shircliffe, & Zalaquett, 2009).

Despite these challenges and concerns, little research has explored what CTE faculty and teacher educators actually do inside the doors of their classrooms (McCaslin & Parks, 2001). In order to address the aforementioned concerns, it is critical to assess the variety of instructional approaches CTE faculty implement in accommodating the varied learning needs of an increasingly diverse student body. This gap in the literature presents a timely opportunity to assess the instructional practices of faculty and instructors in the field of CTE, to uncover the most frequently implemented pedagogical approaches used to address diverse learners and differentiated learning needs of students. The implications of this study should help identify underutilized, alternative instructional methods that have the potential of appealing to a diverse group of students, thereby helping to enhance the quality of instruction and maximizing student learning across institutes of higher education.

Purpose and Research Questions

The purpose of this research study was: (a) to identify the least and most frequently used instructional strategies by CTE faculty across the nation and (b) to identify the potential signature pedagogies in CTE. To meet these objectives, the following research questions were examined:

1) what are the most frequently implemented instructional strategies by CTE faculty;
2) what are the least frequently implemented instructional strategies by CTE faculty; and
3) what are the potential signature (top three used) pedagogies in CTE?

Review of Literature

Many universities and colleges have placed increased emphasis on teaching excellence in higher education, and research has provided rationales for this importance (for example, Boyer, 1990). Efforts to promote teaching excellence vary from the development of alternative, novel pedagogies as well as research exploring strategies to improve existing teaching practices. Shulman (1987) underscored the need for adequate pedagogical content knowledge, which is the knowledge about how to teach in particular fields, as an important characteristic of an effective faculty member. He argued that simply possessing knowledge of a particular subject is not sufficient enough to effectively teach. This lack of sufficiency is primarily due to the gap between an individual possessing pedagogical knowledge and one that has pedagogical content knowledge (Bransford, Brown, & Cocking, 1999).

Thus, one of the first questions instructors in higher education should ask themselves is "What are the most effective instructional methods I might use to teach students in my field?". Although a limited number of recent studies have sought to identify or describe the signature pedagogies in various fields, this type of study has not yet been attempted in the field of CTE. What few studies which have been explored in regard to instructional strategies within the field

of CTE have been rather fragmented at best. In that context, two studies were found: one which investigated instructional strategies used by K-12 CTE teachers and the other by CTE faculty.

Instructional Strategies Implemented by K-12 CTE Teachers

Through survey research, Rehm (2008) investigated K-12 CTE teachers (specifically 14 business, 17 family and consumer sciences, and 10 trade and industry teachers) dispositions regarding challenges, rewards, and instructional strategies implemented with their linguistically and culturally diverse students. She found CTE teachers' identified a myriad of strategies such as the use of visual aids, extra handouts, repetition with technical concepts, demonstrations, hands-on projects in lieu of oral presentations and written papers, practice of new skills, culturally relevant examples, partitioning processes into smaller steps, graphic organizers, and concept maps in their classrooms to assist them in overcoming language barriers. In addition, teachers used cooperative learning techniques such as small groups, laboratory projects, and team based assignments. Despite the challenges in implementing diverse instructional strategies, the vast majority of CTE teachers in Rehm's study found that working with diverse students was quite a rewarding experience.

Instructional Strategies Implemented by CTE Faculty

In terms of instructional strategies that CTE faculty and instructors use in CTE certification programs, Bruening and Scanlon (2001) found, from a survey of 227 programs at 164 institutions, lecturing and labs which were aligned with student teaching internships were the most frequently utilized methods for teaching students. The researchers also found that designing meaningful instructional tasks based on real-world problems was identified as the highest perceived importance with regard to curriculum integration skills for their teacher candidates. They also discussed a need to introduce newer and more innovative teaching methods for CTE faculty and instructors through professional development.

However, studies have yet to investigate instructional strategies for teaching CTE courses in the broader context of the profession at the national level with not only undergraduate teacher certification programs, but also those at the graduate levels. Similarly, no prior studies have attempted to apply Shulman's (2005) vision of signature pedagogies. This gap in the literature provides a timely opportunity to conduct a national investigation to identify the most frequently used instructional strategies in the field of CTE. Such findings would inform both novice and experienced CTE doctoral students, faculty, and instructors about the alternative pedagogies they might consider when teaching CTE courses, and thus potentially expand their portfolio of instructional strategy use in the future.

Theoretical Framework

Logically, different fields employ various instructional strategies to prepare their graduates with specific knowledge, skills, and dispositions. Shulman's (2005) concept of signature pedagogies explains the unique but pervasive ways of teaching within a discipline or profession. He described the concept of signature pedagogies as:

> The types of teaching that organize the fundamental ways in which future practitioners are educated for their new professions. In these signature pedagogies, the novices are instructed in critical aspects of the three fundamental dimensions of professional work – to think, to perform, and to act with integrity. (Shulman, 2005, p.52)

Shulman (2005) asserted that signature pedagogies should be the first pedagogies that come to mind when asked about the major instructional practices needed to prepare individuals for a particular profession. For example, having a senior physician teach by a patient's bedside while asking a group of interns about the symptoms and potential treatment options, are the signature pedagogies in Medical school. Shulman (2005) indicated that a signature pedagogy has three dimensions: surface structure (strategies which may be viewed at the time when teaching and learning takes place), deep structure (the body of knowledge being taught to prepare individuals in the profession), and implicit structure (the moral dimensions which express professionalism within a profession).

In some fields, signature pedagogies are easily identified, while in others, they are not easily established. A number of published books have discussed practices in specific professions such as clergy (Foster, Dahill, Golemon, & Tolentino, 2005), lawyers (Sullivan, Colby, Wegner, & Bond, 2007), nurses (Benner, Sutphen, Leonard, & Day, 2009), engineers (Sheppard, Macatangay, & Colby, 2009), and physicians (Cooke, Irby, O'Brien, & Shulman, 2010). In addition, there are two books which consist of a collection of commonly used pedagogies in various fields: *Exploring signature pedagogies: Approaches to teaching disciplinary habits of mind* (Gurung, Chick, Haynie, & Ciccone, 2009), and *Exploring more signature pedagogies: Approaches to teaching disciplinary habits of mind* (Chick, Haynie, Gurung, & Ciccone, 2012). Each chapter describes the "habits of the mind", the traditional or generic ways of teaching students in a field, and identifies signature pedagogies, which teach students professional practices and values. However, in other fields there have not been apparent signature pedagogies identified. Although there is a chapter regarding signature pedagogies in the field of teacher education, there has been no discussion about signature pedagogies in the field of CTE.

Methods

Research Design

This study implemented a survey research design using descriptive statistics. Specifically, frequencies, means, and ranges were employed to examine the research questions: (a) what are the most frequently implemented instructional strategies used by CTE faculty; (b) what are the least frequently implemented instructional strategies used by CTE faculty; and (c) what might be the signature pedagogies of the CTE field.

Participants

Demographics

This study was comprised of 387 respondents who completed an online survey (using SurveyMonkey) out of 1518 potential participants, thereby resulting in a 26% response rate.

Cook, Heath, and Thompson (2000) found average response rates for internet-based surveys fell in a range from 25 to 35%. Therefore, it is important to note that given the descriptive nature of this study, research findings can only be generalized to the 387 respondents in this study. All participants were currently teaching in a higher education setting; 97.6% were located in the United States including Puerto Rico, while 2.4% were outside of the United States. Of the total respondents, 52.6% were female and 47.4% were male. In terms of ethnicities, 86.8% were Caucasian, 9.9% were Black or African American, 3.3% were Hispanic, 1.9% were Asian, 1.7% were American Indian or Alaska Natives, 0.6% were bi-racial, and 0.3% were Asian American. Their ages extended from 22 to 72 years with a range of 50 years.

Professional Backgrounds

In regard to their current professional positions, 4.9% were graduate assistants, 4.9% were adjunct faculty, 9.0% were instructors or lecturers, 22.5% were associate professors, 26.9% were assistant professors, and 27.4% were full professors. In addition, 2.3% held the roles of both professor and administration, and 1.3% were Emeritus professors. Participants also taught in a variety of institutional settings: 9.1% taught in a two-year college, 14.4% taught in a four-year college/baccalaureate-degree granting college, and 74.9% taught in a four-year graduate-degree granting university. With respect to disciplines in which the respondents taught, 33.1% taught in agricultural education, 30.2% were in business and/or marketing education, 17.6% were in engineering and/or technology education, 13.2% were in family and consumer sciences education, 7.5% were in trade and industrial education, 4.7% taught CTE or workforce education holistically, 2.6% were in health occupations education, 1.3% were in other disciplines, 1.0% were in adult education/HRD, and 0.5% were in educational leadership. Further, 75.7% of the higher education faculty and instructors completed a four-year teacher preparation program, 6.3% completed an alternative teacher licensure program, and 17.9% did not complete any type of teacher preparation program. Years of teaching experience ranged from .5 years to 43 years with an average of 10.2 years.

Courses Taught

Participants taught at various levels in higher education and several taught at two or more levels: 84.4% taught at the undergraduate level, 26.4% taught at the Masters level, and 5.3% taught at the doctoral level. In terms of delivery format, participants taught using various delivery modes and several taught using two or more delivery formats: 24.3% taught courses using a blended format, 68.8% taught face-to-face, and 22.8% taught online. With regard to class size, 23.0% taught classes with 1 to 14 students, 57.1% taught classes with 15 to 29 students, 13.8% taught classes with 30 to 49 students, and 6.1% taught classes with 50 or more students.

Procedures

This study employed non-probability sampling (Ary, Jacobs, Razavieh, & Sorensen, 2006), specifically utilizing a purposive sampling procedure. Online surveys were sent to a sampling frame of 1518 CTE faculty members listed in the following professional association databases: (a) the Association for Career and Technical Education Research, (b) the American Association for Agricultural Education, (c) the Delta Pi Epsilon professional organization, (d) the

National Association for Business Teacher Education, (e) the National Association of Teacher Educators for Family and Consumer Sciences, and (f) the Council on Technology Teacher Education. Two follow-up emails were sent to non-respondents.

Instrumentation

A questionnaire was developed and consisted of 14 demographic questions and 107 items targeting instructional strategies CTE higher education faculty employ in their classrooms. To determine whether items on the questionnaire did indeed represent a comprehensive list of instructional strategies as well as captured the areas the instrument was designed to measure, content validity was measured (Ary et al., 2006; DeVellis, 2003) by a panel of six expert judges in the field of CTE teacher education. These expert judges were comprised of higher education faculty members teaching in agricultural education, business and marketing education, and family and consumer sciences. Based on the expert panel's recommendations, revisions were made to items of the instrument accordingly.

Findings

The most frequently used instructional strategies were determined based on frequency statistics from the rating *Almost Always/Always* (See Table 1). To that end, the six most frequently used instructional strategies included: questioning (47.6%), whole group discussion (34.3%), guided practice (32.6%), interactive lecture (31.5%), self-directed learning (31.3%), and problem-based learning (30.0%).

Table 1
Most Frequently Used Instructional Strategies

		Ratings					
		Never/ Rarely		Occasionally/ Frequently		Almost Always/ Always	
Rank	Instructional Strategies	n	%	n	%	n	%
1	Questioning	10	2.8	178	49.6	171	47.6
2	Whole Group Discussion	43	12.0	193	53.8	123	34.3
3	Guided Practice	33	9.2	209	58.2	117	32.6
4	Interactive Lecture	40	11.1	206	57.4	113	31.5
5	Self-Directed Learning	100	28.2	144	40.6	111	31.3
6	Problem Based Learning	60	16.8	187	52.2	111	31.0
7	Major Writing Project	158	44.8	97	27.5	98	27.8
8	Lab Activities	164	45.8	103	28.8	91	25.4
9	Demonstrations	79	22.1	189	52.8	90	25.1
10	Student Presentations	69	19.3	203	56.7	86	24.0
11	Short Paper	108	30.5	165	46.6	81	22.9
12	Student Peer Assessment	136	38.5	137	38.8	80	22.7
13	Self Assessment	118	33.4	156	44.2	79	22.4
14	Small-Group Discussion	62	17.3	217	60.4	80	22.3

15	Online Discussions	178	50.1	100	28.2	77	21.7
16	Quizzes	131	36.6	152	42.5	75	20.9
17	Personal Reflection	183	51.8	100	28.3	70	19.8
18	Cooperative Learning	56	15.6	231	64.5	71	19.8
19	Learning Portfolio	196	55.5	92	26.1	65	18.4
20	Student Attitude Survey	196	55.4	99	28.0	59	16.7
21	Brainstorming	105	29.2	194	54.0	60	16.7
22	Asynchronous Online	226	63.7	70	19.7	59	16.6
23	Student Peer Teaching	113	31.5	189	52.6	57	15.9
24	Review Sessions	151	42.2	152	42.5	55	15.4
25	Literature Review	171	48.3	130	36.7	53	15.0
26	Online/E-Portfolio	219	61.7	84	23.7	52	14.6
27	Case Study	112	31.6	192	54.2	50	14.1
28	Lecture	122	34.0	187	52.1	50	13.9
29	Think/Pair/Share	100	27.9	212	59.1	47	13.1
30	Online Formative Quiz	244	68.7	65	18.3	46	13.0
31	Film/Video Critique	181	51.3	128	36.3	44	12.5
32	Informal Writing	152	42.5	163	45.5	43	12.0
33	Original Research	226	63.8	86	24.3	42	11.9
34	Computer Based Exercises	219	61.7	95	26.8	41	11.5
35	Annotated Bibliography	245	69.4	70	19.8	38	10.8
36	Background Knowledge	206	58.2	110	31.1	38	10.7
37	Minute Paper	219	61.0	104	29.0	36	10.0
38	Online Collaborative Presentations	234	65.9	87	24.5	34	9.6
39	Service Learning	244	69.1	76	21.5	33	9.3
40	Field Trips	218	61.8	106	30.0	29	8.2
41	Campus Events	208	58.8	117	33.1	29	8.2
42	Role Play	212	59.2	119	33.2	27	7.5
43	Reflective Blogs	263	74.1	67	18.9	25	7.0
44	Social Networking	248	69.9	84	23.7	23	6.5
45	Concept Maps	224	63.3	108	30.5	22	6.2
46	Video Creation	271	76.8	61	17.3	21	5.9
47	Lecture Note Comparisons	254	70.9	86	24.0	18	5.0
48	Debates	238	66.5	103	28.8	17	4.7
49	Student-Generated Quiz	270	76.3	69	19.5	15	4.2
50	Synchronous Online	301	84.8	40	11.3	14	3.9
51	Guest Lecture	177	49.3	170	47.4	12	3.3
52	Question & Answer	307	85.5	42	11.7	10	2.8
53	Games	225	62.8	125	34.9	8	2.2

The least frequently used instructional strategies were determined based on frequency statistics from the rating *Never/Rarely* (See Table 2). As such, the six least frequently used

instructional strategies included: question and answer using clickers (85.5%), synchronous online lecture (84.8%), video creation (76.8%), student-generated exams and quizzes (76.3%), reflective blogs (74.1%), and lecture note comparison (70.9%).

Table 2
Least Frequently Used Instructional Strategies

		Ratings					
		Never/Rarely		Occasionally/ Frequently		Almost Always/Always	
Rank	Instructional Strategies	n	%	n	%	n	%
1	Question & Answer	307	85.5	42	11.7	10	2.8
2	Synchronous Online Lecture	301	84.8	40	11.3	14	3.9
3	Video Creation	271	76.8	61	17.3	21	5.9
4	Student-Generated Quiz/ Exams	270	76.3	69	19.5	15	4.2
5	Reflective Blogs	263	74.1	67	18.9	25	7.0
6	Lecture Note Comparison	254	70.9	86	24.0	18	5.0
7	Social Networking	248	69.9	84	23.7	23	6.5
8	Annotated Web/Bibliography	245	69.4	70	19.8	38	10.8
9	Service Learning	244	69.1	76	21.5	33	9.3
10	Online Formative Quizzes	244	68.7	65	18.3	46	13.0
11	Debates	238	66.5	103	28.8	17	4.7
12	Online Collaborative Projects	234	65.9	87	24.5	34	9.6
13	Original Research Proposal	226	63.8	86	24.3	42	11.9
14	Asynchronous Online Lecture	226	63.7	70	19.7	59	16.6
15	Concept Maps/ Mind Maps	224	63.3	108	30.5	22	6.2
16	Games	225	62.8	125	34.9	8	2.2
17	Field Trips	218	61.8	106	30.0	29	8.2
18	Online/E-Portfolio	219	61.7	84	23.7	52	14.6
19	Computer Based Exercises	219	61.7	95	26.8	41	11.5
20	Minute Paper	219	61.0	104	29.0	36	10.0
21	Role Play	212	59.2	119	33.2	27	7.5
22	Campus Events	208	58.8	117	33.1	29	8.2
23	Background Knowledge Probe	206	58.2	110	31.1	38	10.7
24	Learning Portfolio	196	55.5	92	26.1	65	18.4
25	Student Attitude Survey	196	55.4	99	28.0	59	16.7
26	Personal Reflection Journal	183	51.8	100	28.3	70	19.8
27	Film/Video Critique	181	51.3	128	36.3	44	12.5
28	Online Discussions	178	50.1	100	28.2	77	21.7
29	Guest Lecture	177	49.3	170	47.4	12	3.3
30	Literature Review	171	48.3	130	36.7	53	15.0
31	Lab Activities	164	45.8	103	28.8	91	25.4

32	Major Writing Project	158	44.8	97	27.5	98	27.8
33	Informal Writing	152	42.5	163	45.5	43	12.0
34	Review Sessions	151	42.2	152	42.5	55	15.4
35	Student Peer Assessment	136	38.5	137	38.8	80	22.7
36	Quizzes	131	36.6	152	42.5	75	20.9
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41	Short Paper	108	30.5	165	46.6	81	22.9
42	Brainstorming	105	29.2	194	54.0	60	16.7
43	Self-Directed Learning	100	28.2	144	40.6	111	31.3
44	Think/Pair/Share	100	27.9	212	59.1	47	13.1
45	Demonstrations	79	22.1	189	52.8	90	25.1
46	Student Presentations	69	19.3	203	56.7	86	24.0
47	Small-Group Student Discussion	62	17.3	217	60.4	80	22.3
48	Problem Based Learning	60	16.8	187	52.2	111	31.0
49	Cooperative Learning	56	15.6	231	64.5	71	19.8
50	Whole Group Discussion	43	12.0	193	53.8	123	34.3
51	Interactive Lecture	40	11.1	206	57.4	113	31.5
52	Guided Practice	33	9.2	209	58.2	117	32.6
53	Questioning	10	2.8	178	49.6	171	47.6

Respondents were also asked to list their top three most frequently used instructional strategies employed in their classrooms. Rankings were identified based on the frequency of respondents which selected each instructional strategy within their top three choices. Therefore, the top three most frequently used instructional strategies by CTE faculty included: interactive lecture (n = 158), questioning (n = 87), and whole group discussion (n =65).

Table 3
Three Most Frequently Used Instructional Strategies

Rank	Instructional Strategies	n	Rank	Instructional Strategies	n
1	Interactive Lecture	158	24	Field Trips	6
2	Questioning	87	25	Informal Writing	5
3	Whole Group Discussion	65	25	Online E-portfolio	5
4	Lecture	59	25	Role Play	5
5	Student Presentations	51	26	Background Knowledge	4
6	Problem Based Learning	49	26	Review Sessions	4
7	Small-Group Student Discussion	48	26	Synchronous Online	4
8	Lab Activities	42	27	Debates	3
9	Demonstrations	41	28	Brainstorming	2
9	Guided Practice	41	28	Concept Maps/Mind	2

				Maps	
10	Online Discussions	34	28	Question & Answer	2
11	Major Writing Project/ Term Paper	32	28	Reflective Blogs	2
12	Cooperative Learning/ Team-Based Teaching	30	29	Campus Events	1
13	Student Peer Teaching	26	29	Games	1
13	Think/Pair/Share	26	29	Lecture Notes	1
14	Short Paper	25	29	Minute Paper	1
15	Case Study	21	30	Social Networking	0
16	Self-Directed Learning	19	30	Student Attitude Survey	0
17	Asynchronous Online Lecture	18	30	Student-Generated Quiz	0
18	Quizzes	17	30	Video Creation	0
19	Guest Lecture	16			
20	Original Research Proposal	13			
20	Student Peer Assessment	13			
21	Learning Portfolio	10			
21	Self Assessment	10			
22	Online Formative Quizzes	9			
22	Personal Reflection Journal	9			
23	Film/Video Critique	7			
23	Literature Review	7			
23	Online Collaborative Projects	7			
23	Service Learning	7			

Discussion

Findings indicated CTE faculty in institutes of higher education most frequently implemented questioning, whole-group discussion, guided practice, interactive lecture, and self-directed learning strategies in their classrooms. Likewise, CTE faculty selected interactive lecture (48%), questioning (23%), and whole-group discussion (17%) as their three most frequently employed instructional strategies. Therefore, the most frequently and top three instructional strategies used are quite similar in that, with the exception of self-directed learning, they are group and discussion-based activities, which involve the interaction among students and their instructors: characteristics which are associated with the improvement of students' motivation and engagement, and are needed to improve undergraduate education (Chickering & Gamson, 1987). The use of interactive lecture, guided practice, and questioning are all forms of direct instruction (Burden & Byrd, 2007). More specifically, these types of instructional strategies would be considered as explicit teaching. In this regard, Burden and Byrd (2007) noted:

> Explicit teaching calls for the teacher to gain student attention, reinforce correct responses, provide feedback to students on their progress, and increase the amount of time that students spend actively engaged in learning course content. (p. 120)

Burden and Byrd (2007) described whole-group discussion as a type of indirect instructional strategy categorized as a social instructional approach to learning: "which permit students to interact with each other in various was to help other's learning" (p. 146). This is consistent with a learner-centered style of teaching and learning. As such, the findings point to the notion that CTE faculty tend to use constructivist approaches to teaching, which facilitates students constructing meaning from information by using active engagement and inquiry strategies (Doyle, 1990). Nevertheless, based on findings, many CTE faculty still commonly rely on lecturing (15%), which ranked fourth in the top three instructional strategies utilized in their classrooms. Lecture, although necessary on occasions, is a passive way of student learning. According to Chickering and Gamson (1987).

> Learning is not a spectator sport. Students do not learn much just by sitting in classes listening to teachers, memorizing prepackaged assignments, and spitting out answers. They must talk about what they are learning, write about it, relate it to past experiences and apply it to their daily lives. They must make what they learn part of themselves. (¶ 17)

Moreover, the use of questioning, whole-group discussion, guided practice, interactive lecture, and lecture are all traditional forms of teaching and learning. Therefore, CTE faculty seem to rely on more traditional approaches in teaching their courses. While, the workforce has changed with new demands for students to learn 21st century skills like creativity, critical thinking, innovation, problem solving, and team work skills (Partnership for 21st Century Skills, 2010): skills which might be developed better with more suitable instructional activities such as case studies, debates, and role playing.

Following Shulman's (2005) description of signature pedagogies, participants' responses to the "Three Most Frequently Used" strategies are especially revealing. As previously discussed, findings revealed that participants' "Three Most Frequently Used" instructional strategies were: interactive lectures, questioning, and whole group discussion; these are the most likely signature pedagogies in the field of CTE. As such, CTE classrooms in higher education primarily use constructivist, interactive learning approaches.

Another promising finding was CTE faculty quite frequently use self-directed approaches in promoting student learning. Considering CTE faculty in higher education settings work with adults and increasingly non-traditional students, especially with regard to graduate-level courses, self-directed learning has been historically associated with effective teaching and learning of adult students. In fact, the goals of self-directed learning are to develop learners' abilities to be self-directed in their learning by accepting responsibility for one's own learning, to promote transformational learning through critical reflection, and to support emancipatory and social action, which assists students in becoming change agents in their everyday lives in response to societal oppression (Merriam, 2001). These capacities are oftentimes developed more as students mature, and may lead to positive dispositions toward life-long learning.

The infrequently used instructional strategies for CTE faculty included question and answer methods using clickers, synchronous online lecture, video creation, student-generated examinations and quizzes, and reflective blogs. With the exception of student-generated examinations and quizzes, all of the least used instructional strategies are associated with the integration of technology into classroom teaching and learning. CTE faculty members` adoption and incorporation of technology in the classroom depends greatly on the value individuals place on it, commitment of time to teaching, willingness to change, and prior technology training (Kotrlik & Redmann, 2009). It is also important to note that technology should be used to enhance the learning of students, not simply for the sake of implementation.

Further Research

This study only examined the surface structure of the pedagogies used in the field of CTE. Additional research to observe the deep and implicit structure of pedagogies used is clearly needed as recommended by Shulman (2005). The researchers suggest that future qualitative studies in the field of CTE be pursued; for example, conducting interviews with exemplary CTE faculty members who have won awards for their teaching could gain some insight into deep and implicit structures of their preferred pedagogies. This might include items exploring their fundamental assumptions about: (a) what constitutes teaching excellence within the field and why they prefer to use specific instructional strategies for teaching their courses; (b) what instructional practices and strategies they believe will maximize student learning; and (c) what dispositions, soft skills, and ethical practices they believe are most needed by CTE professionals, and how these might be best taught to CTE students.

Future studies might also consider conducting direct classroom observations to reveal possible signature (top three used) pedagogies from the observer's perspectives rather than instructors' perspectives. To complete such observations, analysis of course assignments and demonstrations of learning as portrayed in course syllabi might also prove enlightening. Moreover, future studies of a quantitative nature might utilize demographic and course characteristics in attempt to explain instructional strategy use.

Conclusion

Despite the need to provide differentiated instruction to diverse learners in contemporary CTE programs across institutes of higher education, little research has explored the actual classroom instructional strategies employed in postsecondary settings. This is quite unfortunate given that many CTE faculty teach future teachers, and have the additional task of modeling effective instructional practices to empower their teacher candidates to implement these practices in their own classrooms.

To that end, this study found CTE faculty most frequently use the instructional strategies of interactive lecture, questioning, whole-group discussion, and guided practice in their courses. Therefore, CTE faculty typically use instructional strategies which align with more of a constructivist approach to teaching and learning: as these strategies promote making meaning through social interaction among their students and with their faculty. However, the instructional

strategies CTE faculty use are traditional-based strategies that have been implemented for decades, and lecture is still a very common form of instruction used by CTE faculty. It is critical for CTE faculty to incorporate more dynamic and novel strategies which promote deep, critical thinking opportunities for students, such as debates, case studies, and role plays, particularly in a world where students need to learn 21st century competencies, such as communication, creativity, critical thinking, innovation, problem solving, and team work (Partnership for 21st Century Skills, 2010).

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