Secondary Family and Consumer Sciences Programs in the State of Texas: A Descriptive Study of the Teachers and Courses

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This research describes the current status of Family and Consumer Sciences (FCS) Education in the State of Texas. Descriptors included the numbers of FCS teachers, the teacher certifications, and the type of FCS courses delivered. Approximately 7,235 FCS courses (grades 9-12) were taught in the State of Texas by 2,948 teachers. The majority of courses were associated with the Human Services Career Cluster. As anticipated, the field of teaching FCS was predominately female; however, some males were teaching in the clusters of Hospitality & Tourism and Human Services. Consistent with previous studies, data obtained in this study reflected a shortage of teachers. Half (50.4%) of Texas FCS teachers were eligible or were approaching eligibility for retirement. An additional 10.7% of current FCS teachers may be eligible for retirement in the next 5 to 10 years. This shortage could be critical to the implementation of FCS programs in the future.

Six years ago data were examined that described the status of the Family and Consumer Sciences (FCS) teaching profession in terms of the numbers of teachers and students taking FCS courses. Since that time, Texas has transitioned to a Career Cluster™ framework for Career and Technical Education (CTE) curricula with new courses and state-level standards implemented in the 2010-2011 school year. FCS is designated as a CTE program, and as such transitioned to offering its courses through five of the 16 career clusters.

Like many other states, Texas is experiencing a shortage of FCS teachers. The purpose of the research reported in this paper was to describe the current status of the profession including the numbers of FCS teachers, the types of teacher certifications, and the delivery of FCS courses in the State of Texas.

Review of Related Literature

In 2006, Wherhan and Way conducted a nationwide examination of secondary FCS education programs and determined nationally that there was a critical shortage of teachers. Texas was specifically identified as a state experiencing a shortage of FCS teachers. Additionally, in this study it was reported that the State of Texas had 3,218 secondary FCS teachers and 195,914 secondary students enrolled in FCS courses (Wherhan & Way, 2006).

Research reported in 2006 by the Texas Education Agency (TEA) revealed that 1,090 (approximately one-third) of these 3,218 teachers were not fully certified. Further, many of the classroom teachers were currently at or approaching retirement eligibility. Specifically, those eligible for retirement in 2006 represented 38% (1,260) of the classroom teachers with an

additional 55% (1,800) eligible in 2010 (Family and Consumer Sciences Distance Education Alliance, 2006).

An ongoing national teacher shortage in FCS has been noted over several decades. Ten years before the Wherhan and Way study of 2006, the American Association of Family and Consumer Sciences passed a resolution addressing the teacher supply and demand. The resolution identified the critical shortages of qualified FCS teachers as an area to be addressed by the profession (AAFCS, 1996). This shortage was confirmed by a national study by Miller and Meszaros (1996) that predicted by the year 2000 the national demand for qualified FCS teachers and Extension professionals would be four times the supply.

These data reflected a need to assess the current state of the FCS teaching profession in Texas. Consequently, an analysis of the statewide teaching records for the 2010-2011 academic year were analyzed.

Methodology

Through a formal open records request as prescribed by Texas Government Code, Chapter 552, a list of Family and Consumer Sciences teachers and courses taught during 2010-2011 was obtained from the TEA. Texas Government Code, Chapter 552, gives the right to access government records. All government information is presumed to be available to the public.

The data, categorical in nature, were reviewed and coded into a numerical system to examine the variables: gender, ages by range, courses taught, teachers by region, area of teacher certification, and type of initial teacher certification program type. Research questions included:

1. What is the current status of the FCS teaching profession in the State of Texas?
2. What do gender and age reveal about the teachers currently in the classroom?
3. What do the courses taught and the teachers by region indicate about FCS program implementation?
4. How are individuals obtaining FCS teacher certification in the State of Texas?

Using *IBM SPSS Version 18*, data were analyzed with descriptive statistics and organized in tables for presentation and discussion.

Results

Approximately 7,235 Family and Consumer Sciences courses (grades 9-12) are taught in the State of Texas by 2,948 teachers (Table 1). Of the teachers, 93.3% ($n=2,750$) were identified as female and 6.7% ($n=198$) were identified as male. The male teachers taught in four areas of FCS with the largest number of them teaching in *Hospitality & Tourism* 52% ($n=102$) and Human Services 28% (n=55). The two other cluster areas with male teachers were *Education & Training* 14% ($n=27$) and *Architecture & Construction* 6% ($n=14$).

Depending on the age at entry into the teaching profession, it can be projected that 50.4% ($n=1483$) of the Texas FCS Teachers are eligible for or are approaching eligibility for retirement. An additional 10.7% ($n=316$) may be eligible in the next 5 to 10 years (Table 1).

Table 1
Age of Teachers Teaching FCS Courses

	Teachers	Course Assignment

Age	n	%	n	%
22-25 Years Old	75	2.5	198	2.5
26-30 Years Old	239	8.1	560	8.1
31-35 Years Old	349	11.8	795	11.8
36-40 Years Old	173	5.9	458	5.9
41-45 Years Old	252	8.5	612	8.5
46-50 Years Old	316	10.7	740	10.7
51-60 Years Old	1,006	34.2	2,551	34.2
60+ Years Old	477	16.2	1,213	16.2
Not known	61	2.1	108	2.1
Total	2,948	100.0	7,235	100.0

Before 1999, the State Board for Education Certification (SBEC) issued Lifetime Provisional Certificates to all teachers. The data revealed that 46.4 % of the FCS teachers currently teaching held those certificates. Currently, SBEC issues what is referred to as a Standard Certificate, which is valid for five years, and can be renewed with completion of a national criminal background check, verification of not being in default of a student loan or in arrears of child support, and completion of the required 150 clock hours of approved continuing professional education (CPE) or 10 college credit hours (Texas Education Agency, 2012a). The Standard Certificate is held by 45.4% of the FCS teachers who were teaching in 2010-11.

Another certificate, the Probationary Certificate held by 3.5% of the teachers in this examination, is a temporary, one-year credential for an educator working toward a Standard Certificate. This credential can be renewed two times allowing the individual to teach in the classroom for three years (Texas Education Agency, 2012a). An example would be a teacher who holds Health certification and is teaching FCS courses while working toward FCS teacher certification. Additionally, this category can include FCS graduates hired by a school district who are working to pass the state certification exams. A variety of other certifications exist (Table 2), however, they are infrequently used by school districts.

Table 2

Certification Type

	FCS Teachers Teaching FCS Courses		Number of FCS Courses Taught	
	n	*%*	*n*	*%*
Lifetime	1,369	46.4	3,577	49.4
Standard	1,338	45.4	3,174	43.9
Professional	9	0.3	29	0.4
Standard Professional	9	0.3	14	0.2
Vocational	2	0.1	5	0.1
Emergency certified	3	0.1	7	0.1
Emergency non-certified	4	0.1	8	0.1
Emergency teaching	2	0.0	3	0.0

One Year	5	0.2	10	0.1
Probationary	102	3.5	218	3.0
Probationary Extension	17	0.6	37	0.5
Probationary Second Extension	14	0.5	28	0.4
Paraprofessional	4	0.1	5	0.1
Standard Paraprofessional	9	0.3	12	0.2
Not known	61	2.1	108	1.5
Total	2,948	100.0	7,235	100.0

Currently, the State of Texas issues three FCS-related teaching certificates (Texas Education Agency, 2012b). The Composite Certificate allows teachers to instruct the largest number of courses in FCS content (potentially 40 courses). Two specialized certificates, one in Human Development and Family Studies and another in Hospitality, Nutrition, and Food Sciences, allow teachers to instruct courses related to FCS content areas such as Child Development and Culinary Arts. Of the FCS certified teachers, those with these specialized certificates accounted for 2.8 % of the teachers in the study (n=49 and 30 respectively). The specialized certificates were created by SBEC in 2005 to address the teacher shortage being experienced in the state. From this data, the authors had no way to determine how many of the teachers who were teaching FCS courses without the appropriate certificate were seeking a Standard Certificate in one of the three areas of FCS certification (Table 3).

Table 3
Area of Certification Held

	Teachers		FCS Courses Taught	
	n	*%*	*f*	*%*
Any Home Economics Certification	1,488	50.4	4,099	56.7
Family & Consumer Sciences, Composite	740	25.5	1,923	26.6
Human Development & Family Studies	49	1.8	120	1.7
Hospitality, Nutrition, and Food Sciences	30	1.0	77	1.1
Any Agricultural Certification	8	0.2	16	0.2
Any Business Certification	194	6.5	264	3.8
Any Technology Certification	13	0.3	17	0.2
Health Science Technology	32	1.2	38	0.5
Any Trades & Industry Certification	73	2.5	164	2.3
Occupational Orientation	4	0.1	14	0.2
Any Science Certification	23	0.7	32	0.4
Any Mathematics Certification	21	0.7	27	0.3
Any Social Studies Certification	14	0.5	17	0.2
Any English Language Arts Certification	54	1.8	95	1.3
Psychology/Sociology	3	0.1	3	0.0
Spanish/Bilingual	6	0.2	6	0.1

Art / Drivers Ed / Music / ROTC	8	0.2	13	0.1
Health Education / Physical Education	40	1.3	68	1.0
Any Early Childhood Education Certification	6	0.2	13	0.2
Speech & Language Therapy	1	0.0	5	0.1
Emotional Disturbed	2	0.1	2	0.0
Generic Special Education	43	1.5	61	0.8
Learning Resources	1	0.0	1	0.0
Counselor	3	0.1	4	0.1
Educational Diagnostician	2	0.1	2	0.0
Generalist	18	0.6	30	0.4
Self-Contained	1	0.0	1	0.0
Not Known	71	2.4	123	1.7
Total	2,948	100.0	7,235	100.0

Teachers holding FCS or the previously offered Home Economics (HE) certification numbered 2,307, while 203 teachers were teaching FCS courses with other certifications that were appropriate to the course (Table 4). For example, a teacher who holds a Business certification is qualified to teach the FCS course, Dollars and Sense. It is important to note that while Business certified teachers can teach Dollars and Sense, FCS teachers can also teach Money Matters, the financial literacy course in the *Business Management & Administration Career Cluster*. There are 438 teachers who were teaching FCS courses without the appropriate teacher certification.

Table 4
Teacher Certification Held

	n	%
Appropriate Certification		
Yes	2,510	85.1
No	438	14.9
Total	2,948	100.0
FCS or HE Certifications		
Yes	2,307	78.3
No	641	21.7
Total	2,948	100.0

When examining the distribution of teachers by region in Texas (Figure 1), it was necessary to utilize an additional source of data. The Texas Education Agency's public database, AskTED, was accessed to determine the number of districts and high schools in each region. Comparisons were then made between the data sources to determine regional program delivery patterns. For instance, Regions 14, 15, and 18 had fewer FCS teachers than high schools. Region 14 (Abilene) had 56 FCS teachers and 43 school districts with 65 high schools. Region 15 (San Angelo) reported 47 FCS teachers, and the region had 43 school districts with 54 high schools. Region 18 (Midland) reported 43 FCS teachers and 46 high schools (Table 5). These regions are the less populated areas of the state in comparison to other regions. The more metropolitan areas

of Houston, Dallas, and Ft. Worth had significantly larger numbers of FCS teachers available in comparison. Region 11 (Ft. Worth) is the second largest region in the state and covers an area equivalent to the size of New Jersey (Education Service Center Region XI, January 2013). Region 11 reported 315 teachers with 78 schools districts and 147 high schools. Region 4 (Houston), the most populous region in the state, showed 500 FCS teachers with 63 districts and 225 high schools that offered 1,154 FCS courses.

Figure 1. Texas Education Service Center (ESC) Map
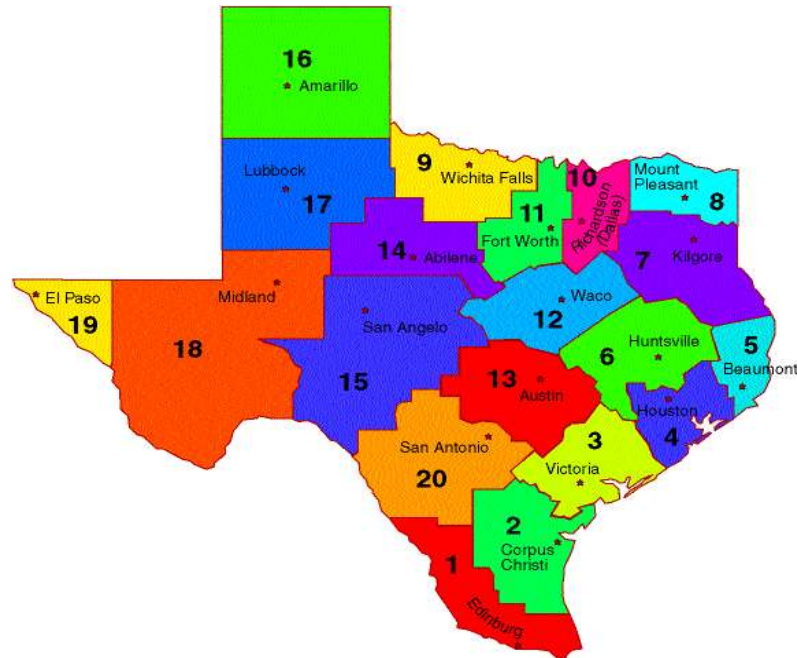
Table 5

ESC by Region

Region	FCS Teachers		Teacher without Appropriate Certification		School Districts	High Schools
	n	*%*	*n*	*%*	*n*	*n*
Region 1 - Edinburg	147	5.0	23	5.3	42	92
Region 2 - Corpus Christi	74	2.5	11	2.5	37	43
Region 3 - Victoria	38	1.3	9	2.1	32	33
Region 4 - Houston	500	17.0	60	13.7	63	225
Region 5 - Beaumont	82	2.8	26	5.9	35	40
Region 6 - Huntsville	119	4.0	19	4.3	56	65
Region 7 - Kilgore	160	5.4	40	9.1	96	103
Region 8 - Mt. Pleasant	60	2.0	16	3.7	41	41
Region 9 - Wichita Falls	47	1.6	9	2.1	38	41
Region 10 - Dallas	473	16.0	56	12.8	100	191

Region 11 - Fort Worth	315	10.7	21	4.8	78	147
Region 12 - Waco	117	4.0	26	5.9	77	89
Region 13 - Austin	174	5.9	17	3.9	64	100
Region 14 - Abilene	56	1.9	10	2.3	43	65
Region 15 - San Angelo	47	1.6	8	1.8	43	52
Region 16 - Amarillo	97	3.3	13	2.9	55	61
Region 17 - Lubbock	87	3.0	16	3.6	59	67
Region 18 - Midland	43	1.5	9	2.1	33	46
Region 19 - El Paso	84	2.8	12	2.7	15	49
Region 20 - San Antonio	228	7.7	37	8.5	61	104
Total	2948	100.0	438	100.0	1068	1654

Course Delivery in Family and Consumer Sciences

Throughout the state, there were 7,235 FCS course offerings at the high school level. The majority of courses (Figure 2) delivered through FCS programs were associated with the *Human Services Career Cluster* (53.8%) (Table 6). Human Services contains courses associated with common content areas for FCS such Child Development, Nutrition, and Financial Literacy. The top three courses frequently offered in this cluster included Principles of Human Services (13.7%)—an introductory, freshmen-level course covering all content in Human Services— Lifetime Nutrition and Wellness (12.3%), and Child Development (11.7%). The second highest area of content delivery included courses associated with the *Hospitality & Tourism Career Cluster* (18.9%). The most frequently offered courses in this cluster included Culinary Arts (6.3%), Principles of Hospitality & Tourism (3.9%), and Restaurant Management (2.1%). The third area included courses taught through the *Education & Training Cluster*. The most frequently taught courses included Instructional Practices in Education and Training (5.4%), Principles of Education & Training (3.7%), and Practicum in Education and Training (3.6%). These three Career Clusters™ are associated with FCS in Texas, however, course offerings are available in two cluster areas outside of FCS—*Architecture & Construction* and *Arts, A/V Technology & Communication*.

Course delivery by region. All 20 regions offered FCS courses in the five related career clusters (Table 7). Consistent with state-level data, the most frequently offered cluster in all regions was Human Services. In 16 of the 20 regions, Human Services courses accounted for the majority of offerings with Region 9 (Wichita Falls) offering more than 75% of its courses in this cluster. The *Hospitality & Tourism Cluster* was offered more frequently in regions of the state with larger cities and tourism opportunities, such Region 20 (San Antonio). The noted exception to this offering was Region 17 (Lubbock) where only 5% of the course offerings were in Hospitality & Tourism. Region 17 includes the City of Lubbock, which has over 277,682 residents and is a regional hospitality and tourism hub (Texas Department of State Health Services, 2013). Region 1 (Edinburg) had the most offerings from the *Education & Training Cluster*.

It appears that 86% of the FCS courses were taught by FCS or HE certified teachers (Table 8). Another 14% of the courses were taught by teachers certified in areas other than FCS or HE, and 9.5% of those courses were taught by teachers without the appropriate certification to teach the courses.

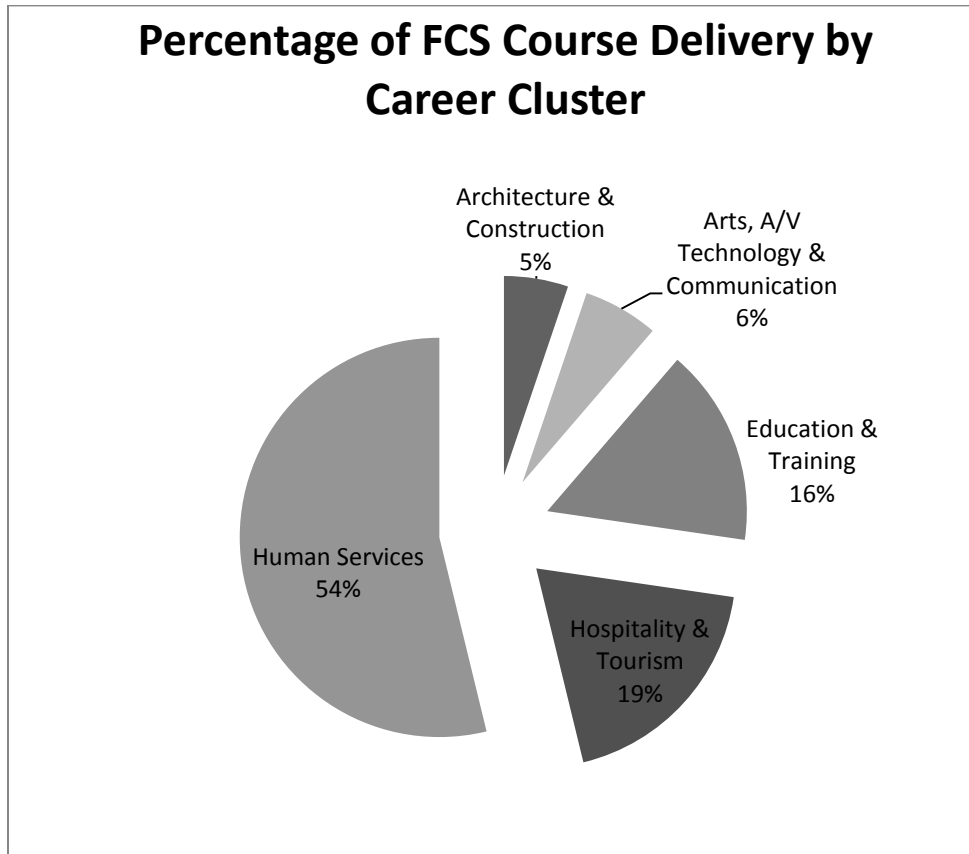*Figure 2.* Percentage of FCS Course Delivery by Career Cluster

Percentage of FCS Course Delivery by Career Cluster

Architecture & Construction 5%

Arts, A/V Technology & Communication 6%

Education & Training 16%

Human Services 54%

Hospitality & Tourism 19%

Table 6

FCS Courses Taught by Career Cluster

	f	*%*
Architecture & Construction Career Cluster		
Interior Design	346	4.8
Advanced Interior Design	21	0.3
Practicum in Interior Design	5	0.1
Practicum in Interior Design II	1	0.0
Arts, A/V Technology & Communication Career Cluster		
Fashion Design	392	5.4
Advanced Fashion Design	41	0.6
Practicum in Fashion Design	5	0.1
Education & Training Career Cluster		
Principles of Education & Training	265	3.7
Human Growth & Development	211	2.9
Instructional Practices in Education & Training	394	5.4
Practicum in Education & Training	260	3.6

Practicum in Education & Training II	32	0.4

Hospitality & Tourism Career Cluster

Principles of Hospitality & Tourism	284	3.9
Hotel Management	40	0.6
Restaurant Management	151	2.1
Travel & Tourism Management	51	0.7
Culinary Arts	453	6.3
Practicum in Culinary Arts	195	2.7
Practicum in Culinary Arts II	41	0.6
Hospitality Services	83	1.1
Practicum in Hospitality Services	60	0.8
Practicum in Hospitality Services II	8	0.1
Food Science	*	*

Human Services Career Cluster

Principles of Human Services	1001	13.7
Dollars & Sense	322	4.5
Interpersonal Studies	303	4.2
Lifetime Nutrition & Wellness	887	12.3
Counseling & Mental Health	68	0.9
Child Development	844	11.7
Child Guidance	216	3.0
Family & Community Services	119	1.6
Practicum in Human Services	105	1.5
Practicum in Human Services II	31	0.4
Total	7235	100.0

* Course taught for science credit by FCS teacher or science teacher. Data requested from Texas Education Agency did not include science courses.

Table 7

FCS Courses Taught by Region

Region	Architecture & Construction Career Cluster		Arts, A/V Technology & Communication Career Cluster		Education & Training		Hospitality & Tourism Career Cluster		Human Services Career Cluster	
	f	%	*f*	%	*f*	%	*f*	%	*f*	%
1	4	1.2	11	3.4	85	26.3	67	20.7	156	48.3
2	9	4.5	11	5.5	30	15.0	25	12.5	125	62.5
3	7	6.0	8	6.9	10	8.6	17	14.7	74	63.8
4	75	6.5	73	6.3	197	17.1	286	24.8	522	45.3
5	11	6.0	14	7.7	34	18.6	25	13.7	99	54.1
6	18	5.7	27	8.5	35	11.0	53	16.7	185	58.2
7	18	4.0	18	4.0	85	18.7	81	17.8	252	55.5

8	5	3.0	14	8.3	21	12.5	26	15.5	102	60.7
9	6	5.2	3	2.6	9	7.8	7	6.1	90	78.3
10	66	6.0	65	5.9	183	16.6	217	19.7	572	51.9
11	36	4.5	41	5.2	168	21.1	162	20.4	388	48.8
12	15	5.2	18	6.2	34	11.7	45	15.5	178	61.4
13	27	6.2	29	6.7	76	17.5	84	19.4	218	50.2
14	2	1.3	9	5.7	15	9.6	24	15.3	107	68.2
15	8	5.9	8	5.9	23	16.9	23	16.9	74	54.4
16	11	4.7	12	5.1	25	10.7	33	14.1	153	65.4
17	14	5.9	12	5.0	28	11.7	12	5.0	173	72.4
18	8	6.5	9	7.3	8	6.5	18	14.5	81	65.3
19	6	3.6	7	4.2	27	16.2	41	24.6	86	51.5
20	27	5.1	48	9.1	67	12.7	126	24.0	258	49.0

Table 8

Courses Taught by Teacher

	f	%
Appropriate Certification		
Yes	6,551	90.5
No	684	9.5
Total	7,235	100.0
FCS or HE Certification		
Yes	6,219	86.0
No	1,016	14.0
Total	7,235	100.0

FCS Teacher Certification

The majority of FCS teachers were trained through a standard baccalaureate teacher preparation program (52.3%, *n*=1,543). An additional 5.8% (*n*=173) were certified through a university post-baccalaureate teacher preparation program offered through a teacher preparation program. These individuals accounted for the teaching of 4,494 of the FCS courses taught throughout the state.

Alternative teacher certification programs are available in the State of Texas (Texas Education Agency, 2012b). Some institutions of higher education, large school districts, education service centers, and private entities have been approved to deliver these alternative programs. Of the certified teachers, 18.5% (*n*=546) have completed an alternative teacher certification program including the appropriate certification exams. These individuals delivered 1,156 of the FCS courses.

In the State of Texas, certified teachers with at least a bachelor's degree can add areas of certification by passing the appropriate certification exam. For instance, a teacher certified in Health can add FCS certification through examination. This group accounted for 14.7% (*n*=432) of the FCS certified teachers currently teaching 1,044 FCS courses.

Table 9
Certification Routes for FCS Teachers

	Teacher		Course Taught	
	n	*%*	*f*	*%*
Standard	1,543	52.3	4,063	56.1
Post-bac	173	5.8	431	6.0
Certification by Exam	432	14.7	1,044	14.4
Alternative	546	18.5	1,156	16.0
Out of State	115	3.9	294	4.1
Vocational Experience	53	1.8	94	1.3
Permit Program	11	0.4	23	0.3
Paraprofessional Program	12	0.4	17	0.2
Jamison Bill	2	0.1	5	0.1
Not known	61	2.1	108	1.5
Total	2,948	100.0	7,235	100.0

Discussion and Conclusions

As anticipated, the field of teaching for FCS in Texas is predominately female; however, some males have chosen this as their profession, especially in the areas of Hospitality and Tourism and Human Services.

Since the publication of Wherhan and Way (2006), Texas has experienced a loss of 270 FCS teachers in reported FCS positions. If the numbers of teachers who are eligible to retire in the next five to 10 years do retire, the profession could experience an unrecoverable shortage. These positions could potentially be filled with unqualified personnel or the local programs may be eliminated.

The number of teachers teaching FCS without the appropriate certification was less than 15%. While a teacher without the appropriate certification is not ideal, some school districts are continuing to meet the demand for FCS content by offering these courses locally. Further, offering FCS and other CTE courses is fiscally advantageous for school districts because in Texas these courses generate weighted funding—more funding than all other courses including core academic areas.

The most popular routes for teacher certification appear to be the traditional university programs, including undergraduate and post-baccalaureate programs. Other routes to teacher certification in Texas do exist—certification by examination and alternative certification programs—however, these individuals may not have the conceptualization of the FCS profession, yet still possess the basic content knowledge needed to pass the certification exam.

The most frequently offered course, Principles of Human Services, covers an array of FCS content and is often used as an introductory course to the content addressed in more advanced courses. The next most frequently offered courses, Lifetime Nutrition & Wellness and Child Development, reflect content that is traditionally associated with FCS. In all career clusters, advanced courses with a strong career preparation focus, e.g. Hospitality Services, Advanced Interior Design, were less frequently taught. These data reflected the first year of implementation for new courses and the organization of courses with a focus on a coherent

sequence reflected in a program of study, which could explain why enrollments in advanced level courses were lower.

Recommendations

The FCS classroom would be enriched with more diverse teacher representation. Recruitment efforts need to include male images and perspectives more often than at present. Successful male FCS teachers could be highlighted in program marketing. Attention could be paid to recruit male teachers from the related college majors as well as the related industries.

The specialized certification options should be considered as a strategy for recruiting new teachers from the specialized undergraduate majors and business and industry. These potential teachers have the content coursework and/or experience needed to meet certification requirements for the more specialized or career cluster specific courses. Specialized certification options should be developed in states where the only route to a FCS teaching certificate is a comprehensive program, sometimes referred to as a generalist degree.

The FCS teaching professional organizations should make a concerted effort to reach out to those individuals who obtain certification by alternative routes and promote opportunities for professional development and networking within the FCS profession.

Efforts should be made at the state level to list FCS as a critical shortage area, similar to listings for Special Education and core areas such as Math and Science. A critical shortage of qualified FCS teachers limits the number of courses offered by a local district, which in turn negatively impacts the fiscal resources available locally. Comparing data from several years would allow the researchers to determine which school districts have closed their FCS programs.

Locally, programs should offer FCS courses in coherent sequences as identified on the state recommended programs of study (AchieveTexas College and Career Initiative, 2013). These sequences provide students with early career exploration experiences that culminate in advance courses with a career focus. In addition, school districts course offerings should mirror business and industry needs of the local economy. For example, it was found that while Region 17 is a hospitality and tourism hub (Texas Department of State Health Services, 2013), the high school course offerings were not addressing hospitality and tourism to the extent needed by local industry. A recommendation is that local program advisory boards and school boards use work force data to develop responsive education programs that address industry needs. This structure can contribute to a student's overall readiness for college and career opportunities. For instance, internships and practicum experiences are more available when education programs collaborate with local business and industry.

Course delivery data by region could be helpful in expanding local programs and partnerships. Teachers could use regional data to identify opportunities and additional course offerings for students. For instance, school districts in Region 9 and Region 17 might be interested in expanding course offerings beyond Human Services; however, targeted professional development and program development ideas might need to be more fully explored. Expansion opportunities and professional development could be supported with postsecondary partnerships. Each of the regions has potential postsecondary partners that could be utilized to offer content-based professional development for teachers and dual-credit courses for students. Local corporate partnerships should also be explored.

In order to obtain a national perspective of the FCS teaching profession, other researchers are encouraged to replicate this study by requesting state-level information that is available

through an open records request. A multi-year analysis would be encouraged so that data could be compared and yearly program changes could be noted.

Limitations

Data obtained by the researchers did not include information on teacher ethnicity; therefore, there was no way to determine ethnicity in the FCS teacher profile for the State of Texas. The data set included local information for 2010-2011, which limited interpretations to that year only. Therefore, there was no way to determine which districts were no longer offering an FCS program.

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Factors Related to the Development
of the Consumer Studies Teaching Portfolio

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The study explored the factors namely skills, benefits, and teaching and learning activities that related to the development of the teaching portfolio in the field of Consumer Studies. Teachers had to select the factors related to the development of the teaching portfolio. Presentation skills and critical thinking received the highest response rate for skills. The benefits of assessing strengths and weaknesses, and making evaluation more meaningful were highlighted by the teachers. None of the factors were omitted by the teachers which indicated that all the factors were relevant when compiling a teaching portfolio at varying levels of importance.

The portfolio, a factual description of a teacher's major strengths and teaching achievements, portrays the teacher's role as an individual, a professional, and reflective practitioner (Xu, 2004; Campbell & Brummet, 2002; Darling, 2001; Painter, 2001; Seldin, 1993). Factors such as skills, activities, and benefits of the teaching portfolio should therefore be considered when compiling it.

A teaching portfolio, a tool of teacher evidence, records the process of assessment and contains various methods of assessments of learners' achievements evaluated according to the purpose of the program, unit, or lesson. The portfolio contains thoughtfully chosen teaching activities supported by evidence to portray its effectiveness (Darling, 2001; Painter, 2001; Seldin, 2000), and which collectively suggest the scope and quality of a teacher's teaching performance. The portfolio serves as a developmental process that requires a teacher to reflect on and improve his/her teaching practice, and is also an assessment product for personnel and professional development, such as permanent status, promotion or a teaching award (Delandshere & Arens, 2003; Campell & Brummet, 2002; Mues & Sorcinelli, 2000). In South Africa, the teaching portfolio contains all the instructions, assessment criteria, and rubrics pertaining to all the continuous assessment (CASS) tasks set for learners (Western Cape Education Department, 2001).

Besides the teaching portfolio being a developmental process, various factors such as skills, activities, and benefits can be developed during portfolio development. Skills developed during the compilation of a teaching portfolio include self-assessment, and improved the understanding of concepts and attitudes towards learning and assessment in the classroom (Slater, 1997) and setting of goals (Apple & Shimo, 2002). Robinson and Bennett (n.d.) indicated that skills such as self-reflection and evaluation, critical thinking, motivation, higher cognitive skill development, skills integration, and enhanced student performance were also developed while compiling a portfolio.

Self-evaluation, a benefit required for portfolio development, entails evaluation of a teacher's performance in the classroom in terms of strengths and weaknesses, and indicates how the teacher has performed against a set of criteria or standards (Klenowski, 2002). Critical thinking, another benefit of portfolio development, encourages teachers to think deeply and critically which can generate questions of clarification of their teaching practice (Khan and Begum, 2012).

Activities related to the development of a portfolio include professional development and beliefs about teaching and learning. It is a useful tool for professional growth in that it encourages self-reflection by teachers on their work (Attinello, Lare, & Waters, 2006; Xu, 2003). The portfolio process provides a sense of empowerment in terms of professional development, indicating that teachers are able to make decisions about the types of professional development required (Attinello et al., 2006). Ford and Ohlhausen (1991) indicated that the inclusion of portfolio assessment in a course helped to change beliefs about assessment. It can be concluded that portfolio development had positive effects for skills, benefits, and activities.

Teachers realize the importance of all the components of a portfolio. Reflection, as a component and a skill (Xu, 2003; Zeichner & Wray, 2001; Mues & Sorcinelli, 2000), is encouraged during portfolio development. Assessment as a component in portfolio development is a way to monitor and measure progress, through documentation of the process of learning or change as it occurs (Sewell, Marczak & Horn, n.d) The assembling of the portfolio is important because its primary objective is to assemble a teaching portfolio that is coherent, attractive, and a functional whole, irrespective of its function as material for a job interview or personal development (Campbell & Brummet, 2002). Teachers find the skills, activities, and benefits of a teaching portfolio has varying importance to them. Presentation skills as a skill for the portfolio have the highest response, followed by assessment of strengths and weaknesses as a benefit, and finally assessment methods as an activity.

Although teaching portfolios are a valuable tool for teacher development there are hindrances to its development. Time is a factor of concern in every aspect of the compilation of the teaching portfolio. Teachers feel that compiling teaching portfolios is a time consuming process (Ford & Ohlhausen, 1991; Apple & Shimo, 2002; Tigelaar, Dolmans, De Grave, Wolfhagen & Van der Vleuten, 2006; Wray, 2007; Kocoglu, 2008). Time is consumed by reflection, conversation, and collecting evidence for the teaching portfolio (Antinello et al., 2006), which could more constructively be used on lesson planning (Attinello et al., 2006; Tigelaar et al., 2006). Teachers see the portfolio as an additional task, increasing their workload (Attinello et al., 2006). Rigidity of structure is also a hindrance to portfolio development (Tigelaar et al., 2006). Wray (2007) indicated instructions about the type of evidence to be included in the portfolio, its purpose, the assessment criteria, and its organizational strategy can be vague. These hindrances were also experienced by students in a study conducted by Apple and Shimo (2002).

Conceptual Framework

"For continuous reflection, portfolio development is an effective tool" (Khan and Begum, 2012, p. 372). Reflection is a compulsory exercise for teachers during the compilation of a teaching portfolio (Tigelaar et al., 2006; Attinello et al., 2006). Anderson & DeMeulle (1998) indicated that the development of a teaching portfolio promoted reflection which allowed teachers to think about their work in a deep and more meaningful way, and facilitated learning, and "facilitates improvement in professional practice" (Kocoglu, 2008). It produced teachers that were more knowledgeable about matters related to the complexities of teaching and about understanding that learning is an ongoing process. Thoughtful reflection about the content that is to be placed in a teaching portfolio is the key to portfolio success (Painter, 2001). Without reflection the teaching portfolio would be a scrapbook filled with artifacts, showing little evidence of a teacher's intellectual and professional ideas (Painter, 2001; Wyatt & Looper, 2004). The reflection stage of portfolio development makes the process authentic, because the teacher has to state the value of each artifact that is placed in the portfolio (Wyatt & Looper, 2004)

Aspects to be considered when reflecting upon artifacts to be placed in a teaching portfolio include:

1. Consider the reason for the item being selected.
2. The artifact selected should display evidence of a teacher's growth and success against one or more of the performance standards.
3. Consider that readers who will be scrutinizing the portfolio out of context should see the reasons for including a particular piece of evidence.
4. Do the chosen artifacts reflect the teacher's professional growth and accomplishments?
5. The artifacts must represent who the person is as a teacher.

To add value to these artifacts teachers should also include a narrative statement or set of reflections that will give the reader insight into what the teacher has learned about him/herself and about the process of teaching and learning (Painter, 2001; Lyons, 1999). Reflective thinking about the content of the portfolio requires thoughts about a teacher's actions, experiences, strengths, and weaknesses about his or her teaching practice (Çimer and Palic, 2012) and can therefore improve teaching.

The most reflective teachers want feedback, initiate problem-solved difficulties, initiate various solutions, effectively learn from their learners, and focus on the dynamic life of the classroom (Willard-Holt & Bottomley, 2000). This correlation between reflection and teacher effectiveness emulates Braun and Crumpler's (2004) notion that reflective teachers have developed the ability to think about their teaching behaviours and the contexts in which they occur. This implies that these teachers can look back on past events, make judgments about them, and modify their teaching practices and beliefs based on the needs of their learners.

Review of Related Literature
Value of Reflection in Portfolio Development
Respondents in a study by Chitpin & Simon (2009, p. 285) stated that they "found constructing the professional portfolio and reflecting on it to be 'an incredibly valuable' experience." Reflection allowed teachers to think about their professional development against set goals and to reflect upon them continuously by modifying existing goals or setting new ones (Chitpin & Simon, 2009). Further, reflection changed their habitual practices and would determine things that worked or that were unsuccessful. Teachers thought of better ideas to improve that had previously been taken for granted. Reflection allowed teachers at various stages of their careers to look within themselves and ask questions about career choice and goals (Xu, 2003).

Reflection during portfolio development allows teachers to examine their teaching practices (Xu, 2003; Zeichner & Wray, 2001; Mues & Sorcinelli, 2000) which provides the opportunity for change in teaching strategies. It is a teacher's responsibility to select, explain and document his or her teaching performance by reflecting on the evidence chosen for the portfolio (Zeichner & Wray, 2001). Chapman, Pettway and White (2001) stated that reflection encouraged teachers to think about teaching techniques, learning styles, content of instruction sessions, and evaluation of teaching styles.

Influence of Reflection on Teaching
In a study by Parker, Ndoye and Ritzhaupt (2012), respondents indicated that the reflections allowed them to develop an improved understanding of their work and develop focus areas to improve their effectiveness as a teacher. In another study by Maat and Zakaria (2010) reflection identified teachers' strengths and weaknesses in their teaching practice and

it motivated them to improve their teaching skills. This improvement took place by improving their presentation skills or by giving the best of themselves to their learners. Williard-Holt and Bottomley (2000) stated that the most reflective teachers were the most effective ones. These reflective teachers showed effectiveness in various areas of their teaching practice. Firstly, the goal of their lessons was for them to learn from their own lessons, and their learners learned more about the topic being taught. Secondly, the planning of their lessons included in-depth and over planning of all aspects of the lesson, flexibility in their lesson, and the ability to alter lessons according to learners' needs. Thirdly, they possessed problem-solving skills because they had insight into problems that arose during their lesson and its causes, and effectively implemented various solutions to these problems. Lastly, the focus of these teachers was on the dynamics that took place during the lesson addressing needs of individual learners instead of on themselves. Therefore, these studies promote reflection as a tool to improve teacher quality. However, there were setbacks or limitations while teachers developed a teaching portfolio and doing reflection on it.

Limitations to Reflection in Portfolio Development

A few setbacks when developing the portfolio are that teachers find it time consuming (Kocoglu, 2008; Anderson & DeMeulle, 1998) and overwhelming (Chitpin & Simon, 2009) due to the preparation of the items to be placed in the portfolio and its appearance (Kocoglu, 2008). Understanding the portfolio concept such as its purpose, logistics, and value of using it is a setback too (Breault, 2004; Anderson & DeMeulle, 1998; Wade and Yarbrough, 1996). Buy-in from teaching staff (Breault, 2004; Anderson & DeMeulle, 1998), lack of consistency in the interpretation of writing the reflections, the development of the portfolio, and support during this process were setbacks (Yao, Aldrich, Foster & Pecina, 2009). Wade and Yarbrough (1996) identified several setbacks when a teaching portfolio is developed, namely presentation and explanation of the portfolio process, lack of exposure to the portfolio process, expectations about education coursework, and lack of effort in the construction of the portfolio. Besides setbacks to the development of a portfolio there are setbacks to reflection upon the teaching portfolio.

These setbacks included lack of familiarity with the concept of reflection, lack of in-service training and time, a heavy workload, lack of student motivation and achievement, absence of constructive and logical criticism, and inadequate collaboration among colleagues (Çimer & Palic, 2012). Lack of coaching can inhibit the reflection process if coaches or mentors do not explain the types of questions that should be asked when reflecting on the teaching portfolio (Driessen, Van Tartwijk, Overeem, Vermunt, & Van der Vleuten, 2005). These setbacks can inhibit reflection which is a crucial aspect of portfolio development and stunt teacher quality and growth. Despite these setbacks, portfolio development can improve the quality of a teacher's work.

Influence of Portfolio Development on Teacher Quality/Behaviour

"A portfolio, being a colourful collection of a teacher's work, shows the interest, strengths, effort, and goals of the teacher to see how he/she thinks, feels, works and changes over a period time" (Khan & Begum, 2012, p. 368). Portfolio development allowed teachers to formulate their teaching practice, assists them to articulate their identity as teachers and identify their strengths and areas of growth (Khan & Begum, 2012; Chitpin & Simon, 2009). Teachers are aware that the chosen artifacts placed in a portfolio reflect their skills as teachers (Kocoglu, 2008) and are evidence of the experiences and learning that displays the practice of effective teachers (Khan & Begum, 2012).

Components of a Teaching Portfolio

The intention of the teaching portfolio should be clear when selecting artifacts as it will influence the type of content and organization of the portfolio (Wyatt & Looper, 2004). To make a teaching portfolio meaningful, the learning outcomes, assessment standards, captions, and written commentary should accompany each portfolio artifact, explaining the content, so that the reader understands the reason for its inclusion and the complex thinking behind the teaching process. Therefore "a portfolio collection should be purposeful, selective, diverse, ongoing, reflective and collaborative exercise" (Wyatt & Looper, 2004, p. 43).

The various components of a teaching portfolio include creating and assembling the portfolio with relevant materials, reflection, assessment, and the portfolio's sustainability with emphasis on its creativity (Smith, Cook, Faulkner & Peers, n.d.). The creation and assembling of portfolio artifacts is a physical product that display a professional collection of materials that represent an important period of training and professional development (Kocoglu, 2008).

Factors Related to the Development of the Teaching Portfolio

Self-Evaluation and Self-Reflection

Chapman et al. (2001) uses the term self-reflection, a major benefit of portfolio development which involves analyzing whether the goals and outcomes set by teachers have been achieved or not, and the reasons for this state of affairs. Part of the process of self-reflection is the self-selection about artifacts to be placed in the teaching portfolio. The selection of evidence is a learning process, because when the teacher evaluates his or her performance, strengths and weaknesses are identified with the intention of improving the teacher's learning outcomes or goals (Klenowski, 2002). It is under each teacher's control to collect evidence for the portfolio (Chapman et al., 2001).

Self-Assessment and Professional Development

Compiling a teaching portfolio is a self-assessment activity, because through collecting evidence for the portfolio, the teacher recognizes areas providing strong, ample evidence of meeting professional standards, as well as areas of the teaching portfolio that lack the necessary evidence. Recognition of the weak areas could motivate the teacher to pursue professional development in these particular areas (Riggs & Sandlin, 2000).

When compiling the portfolio, the teacher has the opportunity to reflect on teaching practice and teaching standards. Thus the teaching portfolio should be assembled in such a way that it displays who the teacher is and his/her experiences and feelings about teaching. The documents in the teaching portfolio will sanction the individual's teaching, application, and organizational skills. Teachers should bear in mind that the professional self is mirrored in the teaching portfolio (Wyatt & Looper, 2004). The teaching portfolio is "first and foremost a tool to support teacher learning" (Painter, 2001) and is a process that is self-developed and promotes continual self-review of the teacher (Riggs & Sandlin, 2000).

Through developing a teaching portfolio teachers are obligated to think about the beliefs and practices conducted in the classroom and to identify discrepancies between beliefs and teaching practices. Teachers who are able to articulate their beliefs are able to justify and reflect on their own practices. They are also able to share teaching practices with colleagues and are prepared to research various methods to improve instruction and support for learners. Riggs & Sandlin (2000) state that the teaching portfolio documents and stimulates the professional development of a teacher. Therefore, it can serve as a link to individualized goal setting.

Goal Setting

        The teaching portfolio should show evidence of teachers' goals and standards to be demonstrated in the classroom (Lyons, 1999). Each goal identified in the teaching portfolio should be accompanied by a plan of action, in other words, the teacher must envisage a specific way of how each goal will be achieved. The goals set should document ways in which teaching in the classroom will be improved (Seldin, Annis & Zubizaretta, 1995). Setting goals while developing a teaching portfolio allows a teacher to reflect on teaching practices.

Purpose of the Study

        The objective of this study was to determine the factors that were related to the development of a Consumer Studies teaching portfolio. Factors included the skills and activities required to develop a teaching portfolio and the benefits gained from developing a portfolio.

Method

        The survey method was utilized. The Consumer Studies teachers of the seven Educational Management Development Centres (EMDC) (Figure 1) in the Western Cape Education Department constituted the population. Each EMDC has a specific number of schools that were grouped according to their location in the province.

Figure 1. Number of Consumer Studies Teachers in the Western Cape Education Department
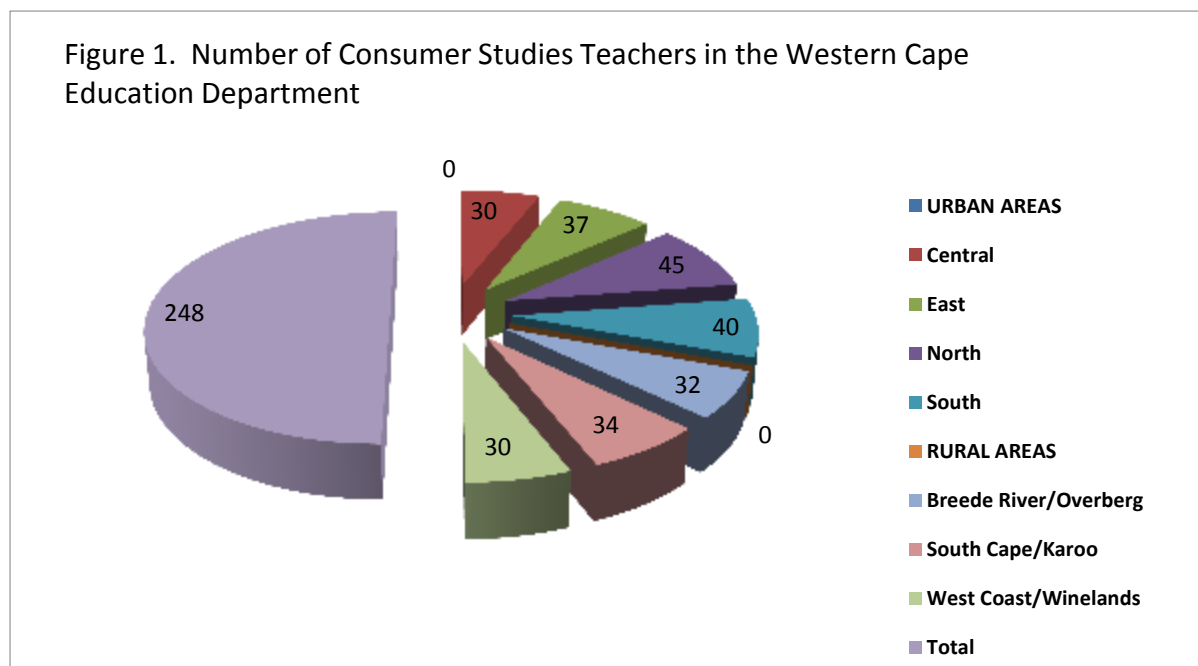
The Research Instrument

        A questionnaire designed by Gordon (1998) titled "Vocational education teachers' perceptions of their use of assessment methods" was adapted and used. The questionnaire included questions about demographics of the participants and the factors related to the development of the Consumer Studies teaching portfolio. The questionnaire included a list of the skills, activities, and benefits which was predetermined by the researcher. Teachers could tick off more than one in each category and they could include any additional skills, activities and benefits that they felt required developing a portfolio. The questionnaire was voluntarily completed by 145 Consumer Studies teachers at the cluster meetings in each district.

Data Analysis

Data was analyzed through the Statistical Analysis Software (SAS) using frequencies and displayed in a graphical format. The mean responses were ranked in descending order and presented in a figure format. The various groups of factors namely skills, activities, and benefits were determined by the questionnaire.

Results

Demographics

The majority of Consumer Studies teachers was female, 40 years of age, and obtained a qualification (Higher Diploma) in Education in Home Economics/Needlework. The teachers had various levels of experiences with no teacher less than five years in the field. It was also noted that Consumer Studies teachers undertook further studies to enhance their personal and professional development.

Skills as a Factor Related to the Development of the Consumer Studies Teaching Portfolio

Teachers had to select the skills that assisted them to develop or complete their teaching portfolio. Presentation skills (see Figure 2) had the highest response rate (69%) followed by critical thinking (60%) and goal setting (55.9%). The skills required to compile a teaching portfolio were rated at 50.3% for self-assessment and 45.5% for self-reflection. Teachers scored journal writing the lowest with a score of 40.7%.

Figure 2. Skills Used for Developing a Teaching Portfolio
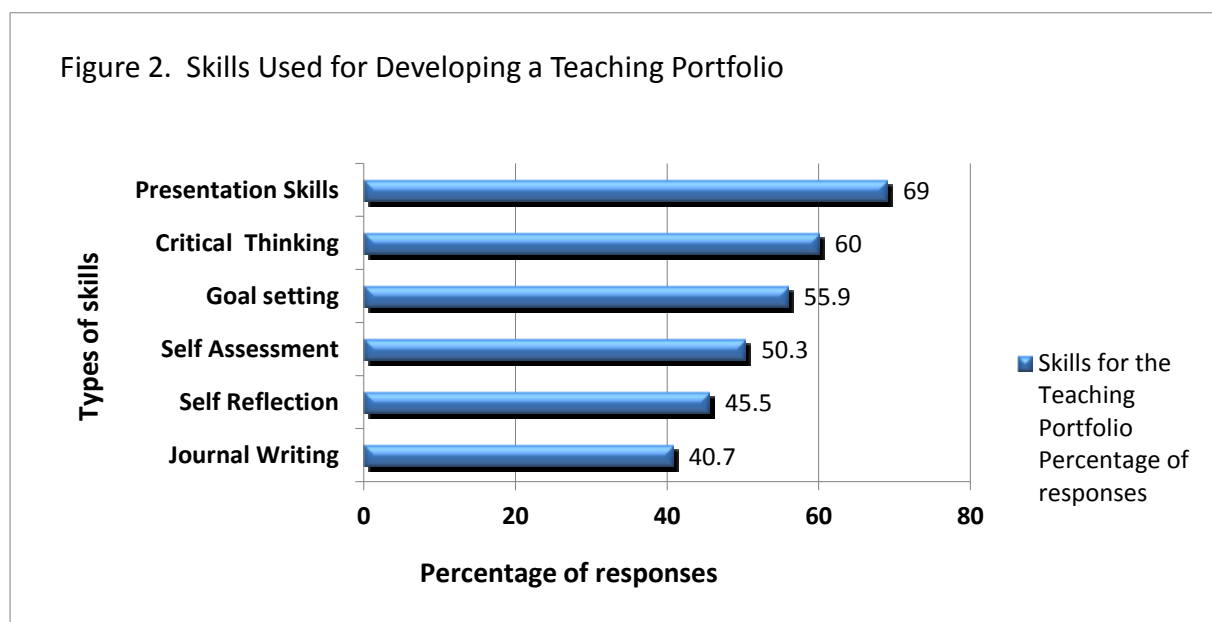
Activities as a Factor for Compiling a Teaching Portfolio

Teaching and learning activities had to be selected that would assist teachers in developing the teaching portfolio (Figure 3). An educator could select more than one of the activities. Assessment methods at 62.8% were the activity with the highest percentage followed by personal teaching outcomes (61.4%), personal growth (56.6%), and teaching methods and strategies jointly at 53.8%.
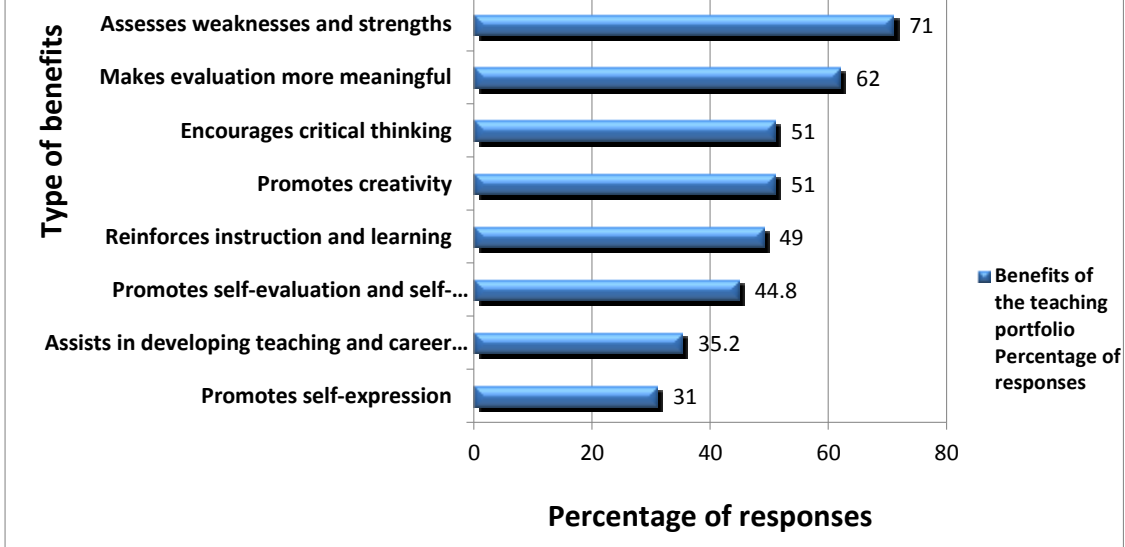
Figure 3. Activities Used for Developing a Teaching Portfolio

Types of activities	Percentage of responses
Assessment Methods	62.8
Personal Teaching Outcomes	61.4
Professional Growth	56.6
Teaching Methods	53.8
Beliefs about Teaching and Learning are reflected in your conduct as a…	45.5

Activities for the Teaching Portfolio Percentage of responses

Percentage of responses
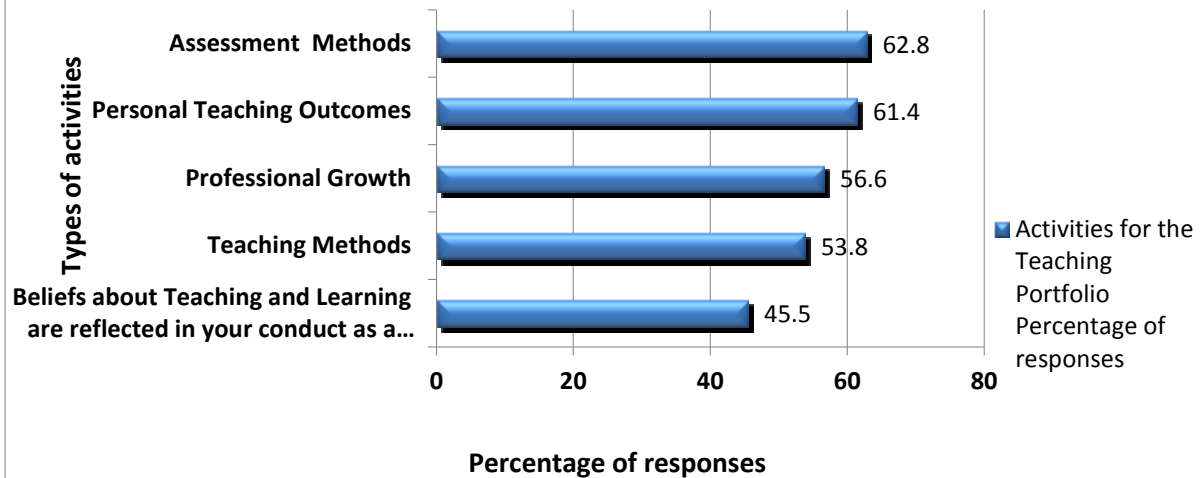
Benefits as a Factor for Compiling a Teaching Portfolio

More than one benefit relevant to their experiences with a teaching portfolio was selected. Of all the benefits "assesses strengths and weaknesses" elicited the highest response rate of 71%, followed by "making evaluation more meaningful" (62.1%). "Promotes creativity" and "encourages critical thinking" elicited the same response rates (51%). Teachers unawareness of the benefit of "self-evaluation and self-awareness" during portfolio development had a low response rate of 44.8%. Critical thinking as a skill had a response rate of 60%, while critical thinking as a benefit had a response rate of 51%.

Figure 4. Benefits used for developing a teaching portfolio

Type of benefits	Percentage of responses
Assesses weaknesses and strengths	71
Makes evaluation more meaningful	62
Encourages critical thinking	51
Promotes creativity	51
Reinforces instruction and learning	49
Promotes self-evaluation and self-…	44.8
Assists in developing teaching and career…	35.2
Promotes self-expression	31

Benefits of the teaching portfolio Percentage of responses

Percentage of responses

Discussion

All the activities, skills, and benefits related to the development of the teaching portfolio were selected by the teachers. Various teachers felt that all the factors were necessary when compiling the portfolio; however, less than half selected some of the items. Assessing strengths and weaknesses had the highest rating (71%) as a benefit of the teaching

portfolio and it is seen as a prerequisite to self-evaluation, because the teachers' strengths and weaknesses need to be identified beforehand (Chapman et al., 2001). This result indicates that the teachers utilized the teaching portfolio to assess their strengths and weaknesses, but omitted the self-evaluation and self-awareness exercises. Literature (Klenowski, 2002; Riggs & Sandlin, 2000) shows that the "assessment of strengths and weaknesses" has to precede "self-evaluation and self-awareness." Studies by Xu (2003) and Chapman et al. (2001) also indicate assessment of strengths and weaknesses as a perceived benefit. The assessment of strengths and weaknesses was thus seen as a valuable benefit in the development of the teaching portfolio. The rating for the benefit self-evaluation and self-assessment in Figure 3, however, elicited a response of 44.8% which is a low rating in comparison to assessing strengths and weaknesses. A possible reason for this low rating could be that teachers were unaware of the benefit of self-evaluation and self-awareness when developing a teaching portfolio. Klenowski (2002) indicated that self-evaluation assessed the teacher's performance in terms of strengths and weaknesses in the classroom. The teaching portfolio as a benefit in the "assistance of educators to develop teaching and career goals" had a low response rate, which could be the result of teachers not consciously thinking about their teaching and career goals. This could be linked to the non-inclusion of a teaching philosophy in the teaching portfolio developed by WCED Consumer Studies teachers.

For activities, the highest response was for "assessment methods" (62.8%) in Figure 3. This high response could be linked to positive attitude to the assessment process that was determined in this study. The assessment process entails the use of various assessment methods that are placed in the teaching portfolio. Therefore, the teachers' response rate to assessment methods was higher than to other activities listed in the questionnaire. Teachers are required to think about the assessment methods that will be used to assess learners before placing them in the teaching portfolio as evidence for moderation purposes.

The activity referred to as "beliefs about teaching and learning are reflected in the conduct of a teacher" elicited the lowest teacher response of 45.5% in Figure 3. This activity is referred to as the teaching philosophy (Darling, 2001; Mues & Sorcenelli, 2000). This is important as it describes the teacher's beliefs about his/her teaching practice, which will in turn influence the teaching practice of the teacher. These beliefs include teacher reflection upon how to assist learners to learn, goals for learners, and the implementation of effective teaching and learning strategies. This low response could be attributed to the fact that teachers were not required to include their teaching philosophy in the teaching portfolio, or that teachers were not trained in writing a teaching philosophy, as this is not a prerequisite for compiling a teaching portfolio for the WCED. Therefore, these teachers have to be taught how to write a teaching philosophy while compiling the teaching portfolio. Similarly, the skill of self-reflection in Figure 2 had the same rating of 45.5% and was also among the lower responses. The reason could be that teachers either do very little self-reflection, or they do not know how to reflect on their teaching practice. This could imply that they do not document their beliefs about teaching and learning that should reflect in their conduct as teachers.

Self-reflection as a skill obtained the second lowest rating for skills of the teaching portfolio (45.5%) as shown in Figure 2, indicating that teachers did not see self-reflection as an essential skill for teaching portfolio development. Chapman et al. (2001) indicated that self-reflection involved not only an analysis of goals and outcomes set by the teachers, but also whether these goals and outcomes have indeed been achieved, as well as the reasons for achievement or lack thereof. Self-reflection and goal setting as skills are interlinked, but a difference in the rating to goal setting (55.9%) and self-reflection (45.5%) were evident (Figure 2). When compiling the teaching portfolio teachers should learn the skill of self-reflection because they must reflect upon the types of evidence to be placed in it (Chapman et al., 2001).

The activities of "personal teaching outcomes," "teaching methods," and "professional growth" were considered in the process of developing the teaching portfolio. Similar percentages of responses were reported for "personal teaching outcomes" and "assessment methods." The association between "personal teaching outcomes" and "assessment methods" can be explained by the recommendation (Mues & Sorcinelli, 2000; Seldin, 2000; Seldin, 1993) for both activities to be placed in the teaching portfolio. "Teaching methods" and "professional development" elicited the same percentage response. Both "professional development" and "teaching methods" should also be included in portfolio development (Campbell & Brummet, 2002; Chapman et al., 2001; Riggs & Sandlin, 2000).

"Critical thinking" as a skill had a rating of 60% and "encourages critical thinking" as a benefit had a rating of 51% for the compilation of the teaching portfolio. This indicates that teachers see critical thinking as a skill and not as a benefit of teaching portfolios. The teachers' preference for critical thinking as a skill is confirmed by the studies of Chapman et al. (2001), while Driessen et al. (2005) established that critical thinking was a benefit in the development of the teaching portfolio. Briede (2005) confirmed the importance of critical thinking as a skill for teaching portfolio development by indicating that for reflection upon the content of the teaching portfolio to take place, skills of critical thinking and evaluation are required.

The responses to the skill of goal setting (55.9%) as depicted in Figure 1 and the activity of professional growth or development (56.6%) in Figure 2 were similar. Riggs & Sandlin (2000) indicated that professional development is a bridge to goal setting. This confirms the relatedness of goal setting and professional growth or development.

Presentation skills and critical thinking had the highest responses for skills are required to compile a portfolio of this kind. The skills of journal writing and self-reflection had the lowest responses which are important skills for teaching portfolio compilation as indicated in current literature. The other skills include self-assessment and goal setting. (Wyatt & Looper, 2004; Campbell & Brummet, 2002; Klenowski, 2002; Chapman et al., 2001; Painter, 2001; Riggs & Sandlin, 2000; Lyons, 1999; Seldin, Annis & Zubizaretta, 1995). The importance of all the skills, namely journal writing, goal setting, self-assessment, self-reflection, presentation skills, and critical thinking were listed in the questionnaire for portfolio development.

The skills, activities, and benefits are all necessary to compile a teaching portfolio, and opportunities have to be created for teachers to acquire the skills, activities, and benefits that elicited low response rates in this study. This would ensure that teachers create successful and complete teaching portfolios that can be used as a valuable assessment tool.

Conclusions

Through the data analysis and results the following linkages between the skills, activities, and benefits of the teaching portfolio were found. Firstly, "critical thinking" is linked as a skill and an activity, but enjoyed preference as a benefit by the teachers. This means that teachers did not regard "critical thinking" as a skill.

Secondly, "goal setting" as a benefit is linked to "professional growth" as an activity, and to "self-reflection" as a skill. Campbell and Brummet (2002), Chapman et al. (2001), Riggs and Sandlin (2000) have indicated that "professional development" acts a bridge to "goal setting," and that through "self-reflection" a teacher can analyse the achievement or lack of achievement of goals.

Thirdly, "self-reflection" as a skill is linked to the activities of "professional growth" and the "beliefs about teaching and learning that is reflected in the actions as a teacher." It has been stated that the teaching portfolio promotes "professional growth," because it

encourages "self-reflection." The latter activity, which was referred to as the teaching philosophy, had the same response rate as "self-reflection," which had low ratings. This result indicated that teachers did not see the importance of "self-reflection" as a skill and the teaching philosophy as an activity in the development of the teaching portfolio.

It may be concluded that skills, activities, and benefits that constituted the factors relating to the teaching portfolio, are all interlinked and necessary. Therefore the teacher has to possess and demonstrate all the factors that are required to develop a successful teaching portfolio.

Recommendations

The following recommendations are suggested to assist teachers in compiling a successful teaching portfolio. Training programs or workshops should be run that would equip teachers with the skills, activities, and benefits that had a low response rate. Further, training can take place in portfolio aspects such as the development of a teaching philosophy from a self-reflective position, developing a road map of teaching activities and for, the skills of self-assessment, journal writing, and writing a reflective statement. Education faculties at higher education institutions should allow student teachers to compile a teaching portfolio during their teaching internship. This would familiarize the student teachers with the concept of the teaching portfolio and reflection.

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Citation

Concept Mapping as a Strategy to Enhance Learning and Engage Students in the Classroom

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It has become increasingly important that students not only gain content knowledge, but also be exposed to strategies that foster development of problem solving, critical thinking, communication skills, and active learning. The focus of this study was to actively engage students with the concepts (knowledge, skills, and dispositions) related to the topic being learned during the contact time between the lecturer and the students through the use of concept maps. The purpose of this article is thus to explore the integration of concept mapping as a teaching strategy within a lecture.

Strategy to Enhance Student Engagement

The lecture method, which characterized my teaching style, cannot be effective on its own to stimulate thinking, to inspire interest in a subject, to teach behavioral skills, or to change attitudes (Newble & Cannon, 2002). Bligh (1972) indicates that the conventional lecture rewards passivity in students rather than active involvement, thus having a lesser chance of developing higher-level cognitive abilities. A weakness of the lecture method is that it allows students to be passive recipients of information (Hansen & Stephens, 2000), become dependent on the lecturer to tell them what they need to know and thus avoid taking responsibility for their own learning (Machemer & Crawford, 2007). According to O'Neill and McMahon (2005), students who value or have experienced more teacher–focused approaches, may reject the student–centered approach as frightening or indeed not within their remit.

Research suggests that, compared to the lecture method, methods that promote active learning increase student achievement (O'Sullivan & Copper, 2003; Christianson & Fisher, 1999), student participation and engagement of content (McClanahan & McClanahan, 2002), increased student satisfaction, better learning outcomes (Chilwant, 2012), and retention of concepts over time (Berry, 2008). As an interactive learning technique develops critical thinking, students are more likely to learn and retain information if they engage with it personally (Rao & DiCarlo, 2000; Saroyan & Snell, 1997).

Graphic organizers (GOs), an approach to teaching and learning, enables teachers and learners to present information in a graphic format (Alshatti, Watters & Kidman, 2011) that promotes visual representations of a person's structural knowledge or conceptual understanding of a particular topic (Novak & Gowin, 1984). Concept maps are graphical tools for organizing and representing knowledge (Novak & Cañas, 2008) and showing the relationship among terms (Vanides, Yin, Tomita, & Araceli Ruiz-Primo, 2005).

Concept mapping is the development of constructed and reconstructed knowledge represented graphically (Novak & Gowin, 1984). It facilitates active learning (Wilgis & McConnell, 2008), encourages student-discovery while learning (Caputi & Blach, 2008), and reflects students' experiences, beliefs and biases in addition to an understanding of a topic (Halford, 1993). Through the process of creating a map, related concepts are linked in a meaningful way that serves as a tool for assessing depth and breadth comprehension and knowledge and for reviewing of previously covered material (Croasdell, Freeman, & Urbaczewski, 2003; Heinze-Fry & Novak, 1990). According to Kinchin, Cabot & Hay (2008)

an important function of the map is to help make explicit complex topics where students may display a fragmentary understanding and are unable to integrate all the components to form a meaningful overview or conceptual framework. Identifying these fragments of understanding, termed 'anchoring conceptions' by Clement, Zietsman and Brown (1989), is vital as these form the foundations for future meaningful learning. In an interview with Cardellini (2004), Novak iterates this by stating that "meaningful learning requires integrating new knowledge with existing knowledge, and thus only meaningful learning can result in building more powerful knowledge structures and remediating misconceptions that may exist" (p.1305).

Additional benefits of concept maps include suitability to all learning styles and being an effective method to convey large amounts of information in a limited time (Burgess & Yaoyuneyong, 2010), improve students' academic achievement, increase information recall and retention, and reduce cognitive overload (Gobert & Clement, 1999; Lee & Nelson, 2005). This is illustrated by Novak and Gowin's (1984) statement that, "students and teachers constructing concept maps often remark that they recognize new relationships and hence new meanings or, at least, meanings they did not consciously hold before making the map" (p. 17).

Theoretical Framework

This research is based on the theory of constructivism where knowledge is not passively received but students become creators where they actively and creatively organize their experience to make sense of the world around them (Amundson, 2003; Brott, 2005). For meaningful learning to occur, students must actively engage with the to-be-learned subject-matter through such activities as discussion, hands-on activities, and problem solving (Hansen & Stephens, 2000). In the context of this study, individuals seek understanding of the world in which they live and work by the construction of conceptual structures through their engagement in self-directed tasks (Conole, Dyke, Oliver, & Seale, 2004).

The origin of concept maps stems from the constructivist theory where learning is characterized by the development of connections between new information and existing knowledge, leading to increasingly complex syntheses (Duffy & Jonnasen, 1992). Learners "construct their own understanding of concepts" (Trowbridge & Wandersee, 1994) by creating knowledge through a process of constructing and reconstructing the meaning of information acquired through their experiences (Novak, 1993). When encountering new material, learners determine, through evaluation and reflection, where and how it fits into their previous knowledge (Novak & Cañas, 2008). Through these cognitive structures, the development of more complex and multifaceted understandings that will, in turn, become an extended set of multi-conceptual systems upon which learners can build further learning (Novak, 1998).

The Teaching Event

Students are required to construct a concept map and through the use of visual representations students are able to categorize elements of information, analyze the relationships between the different elements presented, and critically evaluate those elements to discern the significance of all that is presented (Hipkins, Reid & Bull, 2010).

The teaching event (with third year Human Ecology students, in the subject of Housing) began with a discussion and demonstration of the process and strategy for drawing a concept map. An introductory lecture on the topic, *the process of acquiring a property* includes the financial and contractual responsibilities of home ownership. A demonstration of the concept map followed the lecture. The introductory lecture, accompanied by pre-class reading material, was followed by the showing of a video which provided good visual background information on the process of acquiring a property. Prior to viewing the video,

students were prepared for how they needed to listen and where to focus their attention. After the screening of the video, students were requested to draw a concept map covering the key concepts expressed during the video as well as the introductory lecture. Students worked in groups of two, choosing a partner of their choice, to assist with the construction of their concept map. They were able to assist one another, highlight the concepts they were struggling with as each student drew a concept map based on an understanding or view of the content. During the class, students were able to develop their concept maps with concepts and information acquired during the lecture as well as the reading material. This strategy was an attempt to encourage students to read, actively focus on and interact with the content, acquire knowledge and skills, and to make the student more aware of what they were doing and why they were doing it. The strategy focused also on transferring of skills (O'Neill & McMahon, 2005). During this lecture, students were provided with reading material that provided further information regarding the topic.

Students were required during a follow up lecture to expand their concept maps with the concepts and information acquired. The lecture consisted of a PowerPoint presentation and discussion, the pre-class reading material as well as further material handed out during the previous lecture. With new information added after the first and during the second lecture, students could see how their concept maps developed. At various intervals the lecturer provided the students with guidelines on how their concept maps should develop. This assisted students and ensured that they had the relevant information depicted on their maps. Mayer, (2004), Kirschner, Sweller, and Clark, (2006) indicated that for active methods to be effective, teachers must provide significant guidance and structure as students who are provided with minimal guidance do not obtain much learning. During the final session, students were given the opportunity to draw their concept maps on newsprint and present it to the class. The lecturer and students commented on each group's concept maps which led to interesting discussions. With this, we tried to clarify difficult or unclear concepts as well as ensure that the correct information was captured.

Evidence of Reflective Practice

Boud, Keogh, and Walker (1985) defined reflection as "a generic term for those intellectual and affective activities in which individuals engage to explore their experiences in order to lead to a new understanding and appreciation" (p. 19). Being a reflective professional requires you to take the time to consider your work, reflect on its objectives and evaluate its outcomes, learn from these experiences, and apply this newfound knowledge to future situations. Reflective practice is therefore "a revisiting of an event in order to understand it better" (Check & McEntee, 2003, p. xiii). Reflection was undertaken by the lecturer to determine whether the change in strategy had an improvement on student engagement.

Lecturer

I came to realize that my teaching style needs to change from a predominantly teacher-centered lecture approach, to approaches that engage students more actively. Through my lecture approach students have become complacent and disengaged as all the information is given through teaching media such as PowerPoint presentations. "If a teacher never questions the goals and the values that guide his/her work, the context in which he/she teaches, or never examines his/her assumptions, then it is our belief that this individual is not engaged in reflective teaching" (Zeicher & Liston, 1996, p.). Through reflection one reaches new found clarity, on which to base changes in action or dispositions.

At the beginning of the exercise, students were reluctant and hesitate to start. An interesting observation is that students have become so complacent and passive that they feel

annoyed if you ask them to do something. Hansen and Stephens (2000) indicated that one main weakness of the lecture method is that it allows students to be passive recipients of information that has been "pre-digested" by the lecturer. They thus become dependent on the lecturer to tell them what they need to know and can thus avoid taking responsibility for their own learning (Machemer & Crawford, 2007). I observed by some students an irritation with dealing with this new way of engaging in the classroom. Lecturers who expose students to a new method that will increase students' engagement and deepen their learning, are likely to be met with confusion by students who already believe they are getting these benefits from traditional lectures (Covill, 2011). Hansen and Stephens (2000), are furthermore of the opinion that students accustomed to being passive have a "low tolerance for challenge" (p. 46). According to active learning proponents, learning as a result of lectures is relatively superficial and transient (Phipps, Phipps, Kask, & Higgens, 2001; Moust, Van Berkel, & Schmidt, 2005).

When students had to start with the exercise they were hesitant and it took some encouragement from the lecturer to get them started. For active methods to be effective, lecturers must provide guidance and structure, as students left to their own explorations of a subject matter with minimal guidance from the lecturer, do not learn much (Mayer, 2004; Kirschner, Sweller & Clark, 2006). Students experienced difficulty at the beginning of the process extracting concepts from the content, and they could not consolidate information and struggled to make linkages. With appropriate guidance it became clearer to students what they were supposed to do. This is turn lead to students becoming actively involved. When students were given the opportunity to draw their concept maps on newsprint, it was interesting to note how much more active and verbal they became. The classroom became lively with lots of discussion in groups and people who were normally quiet or passive began to engage with one another.

Distributing pre-reading material and activities, and communicating an understanding of what was expected assisted students understanding and willingness to partake in a new approach. The detail of the concept map suggested that students read or had done additional reading. This in turn enabled the lecturer to spend more time helping them explore the "hands on" techniques of new approaches, as well as critical reasoning and communication skills. Again, Novak indicated in an interview with Cardellini (2004) that any person can build good concept maps "with appropriate instruction, practice and constructive feedback" (p. 1305).

I observed that there were students who preferred the traditional lecture instead of the interactive methods used in class. I came to the conclusion that to be reflective about one's practice it is essential to step back from the immediacy of the situation and examine one's beliefs, attitudes, values, and behavior in a dispassionate manner (Jackson, 1990) and bring about necessary changes.

Reflection of Peers

Students divided themselves into groups and were given the topic for the concept map. Initially students struggled to start the concept map but were guided, individually and as the need arose, by the lecturer through questions that were posed to them. When students asked questions, the lecturer posed the questions to the class which allowed them to think about and engage with the content of the topic. The questions posed were thought provoking and the atmosphere in the class was engaging. During the session, the lecturer continuously gave students input to assist them in developing their maps.

At the beginning of the session students found it difficult to start drawing a concept map about the given topic. The longer students engaged with the topic the easier it became for them to draw the concept map. Probing of the topic through questions by the lecturer also

facilitated the ease at which students began drawing the concept maps. Working in groups of two allowed students to grapple with the difficult concepts together and this kept them motivated. Groups were able to work at their own pace and construct the concept maps according to how they understood the topic.

Reflection of Students

The best evidence of the power of a reflective activity is when the learning revealed can be seen to be beneficial to the personal growth of the student (Doel, 2009). Students were required to reflect on their experiences about concept maps. Here is what some of them had to say:

Write your opinion and feelings with regard to the changed approach in offering the lecture:

> *"I felt confused at first, but it helped us to engage with the content."*
> *"More interaction with classmates, engaging more with topic. I have learned more by getting information by doing research."*
> *"The interaction in class helps me to understand the work better. It is a good approach; it makes us engaged with the subject."*

On the question "What was your experience with regard to the video? Is it a good way of introducing a new topic/concept?" Students had the following to say:

> *"The video was a good way but for me it took time for me to understand it."*
> *"Interesting. Would have liked to have it played again. Reason: did not catch all the aspects and buying process in terms of home ownership."*
> *"Yes, the video provided new information."*
> *"Watching a video is interesting and makes class fun especially because it is not done a lot."*
> *"It was a different style, but a recap lecture would have been appreciated too."*
> *"Yes the video is good in engaging with the topic because we saw what the topic is about and not just words. Visuals also make things to be understandable because they are seen."*

An activity sheet was provided after the video was shown. Students were asked whether the activity sheet added more to their knowledge with regard to the topic which was covered with the video. The comments were as follow:

> *"Yes, it gave me more knowledge as I was stuck with the concept map."*
> *"Yes, it was a load of information, but provided more understanding. Yes, because I was then able to understand the work better."*
> *"It made me more confused, in terms of selecting the proper info from the many points given."*

Whether it was a useful exercise or not, the students expressed it this way:

> *"Indeed it is, because it helped us to engage more. It was in terms of getting to know and utilize concept maps; it also introduced us to another way of studying."*
> *"Yes, I learned new process to concept your ideas, to use in future."*

Not all students experienced the new approach the same way. Hansen and Stephens (2000) state that students accustomed to being passive have a "low tolerance for challenge" (p. 46).

> *"No need to do interactive activity every week. I prefer the normal lectures with PowerPoint presentations."*
> *"Concept map was difficult at first to understand, but I got there."*
> *"Concept maps were confusing, too many concepts to make the connection and selecting the relevant heading according to the topics."*

I have noted that there are students who prefer the traditional lecture method instead of classroom practices that allow them to engage with the content. The students' reflections allow me to understand that many of them may resist, and are even hostile toward the lecturer's attempts to use active learning methods. Therefore, lecturers who want to use active learning methods must recognize that many students view the lecture method very positively in terms of engagement with the course and the quality of their learning. There are probably students who would see no advantage to switching to a method that forces them to be more independent and active (Covill, 2011).

This attempt at changing my teaching approach brought about a realization, that to enhance the traditional lecture method, I should use teaching strategies that engage students with the content while the lecture is taking place. With the introduction of a new classroom practice to students, I realized I have to give them an outline about the new content to be covered as well as a hand-out with step-by-step instructions about how to construct a concept map. This would have been a more useful resource which might have made the construction of a map easier.

Students' comments on the viewing of the video have indicated there are students who prefer a visual representation of content. It is also important, for those students who require more time, that I need to make provision for showing it a second time or place it on the eLearning management site where students can access it at a time convenient to them. Different teaching strategies need to be implemented as Simon (1999) indicated "If each child is unique, and each requires a specific pedagogical approach appropriate to him or her and to no other, the construction of an all-embracing pedagogy or general principles of teaching become an impossibility" (p.).

Conclusion

The aim of the change in my teaching style was to get the students to move from passively listening to being actively engaged with the lecture content and information. The exercise of constructing a concept map required students to pay attention to the video and lecture by forcing them to reflect interactively on the content of the lecture. In the way the objective of the lesson was achieved, to help students engage with the subject matter in an active way instead of only listening to a lecture or PowerPoint presentation. Students' responses to this method were different. Some students welcomed the concept mapping approach as it assisted in their learning. They perceived it as a tool to enhance the lecture and make it more meaningful for them. Even those who were resistant to the method were forced to think about the topic and respond to the content in a way that allowed greater discussion and interaction between peers and lecturer. Through this I hope another dimension/facet was added to their learning.

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Citation

The Role of High School Teachers
in Hispanic Students' Sense of Belonging in College:
Implications for Family and Consumer Sciences Educators

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Although Hispanics are the fastest-growing and largest minority group in the United States, our educational system has struggled to respond to the influx of culturally diverse students in a way that significantly impacts their academic success. Hispanic students drop out of high school at a higher rate and are less likely to attend college, and/or complete degrees. Deficit-based literature only highlights the statistical nature of the educational crisis facing Latino students in the United States which simultaneously creates an occlusion for solutions to surface. In this study, high achieving female Hispanic students (N=80) in a department of Family and Consumer Sciences of a major Hispanic-serving land-grant university located near the American-Mexican border were surveyed to determine factors contributing to their academic successes. Results indicated that students' relationship with their high school teachers played a significant role in their sense of belonging to the university. Implications for FCS educators are discussed.

In 2010, Hispanics comprised 16% of the total population of the United States, totaling 50.5 million people (Humes, Jones, & Ramirez, 2011). Between 2000 and 2010, the Hispanic population grew by 43% and currently constitutes the fastest-growing and largest ethnic or minority group in the U.S. Only Mexico has a larger Hispanic population than the United States (U.S. Census, 2010). Projections suggest that Hispanics will make up approximately one-third of the total U.S. population by 2060.

Even though 62% of Hispanics 25 and older in the U.S. have at least a high school education, the educational system is imbued with obstacles and challenges that Hispanics must overcome in order to achieve success. All ethnic, racial, and cultural groups have unique challenges; however, those faced by Latinos (which include language acquisition, familial obligations, culturally-based gender stereotypes, and acculturative stress) may exacerbate the effect of risk factors on educational attainment and success. The literature is inundated with examples of the achievement gap between Latino students and their non-Latino counterparts. For example, researchers and educators know that Hispanics are retained a grade at a rate three times higher than that of the overall population (Valenciana, Weisman, & Flores, 2006). All stakeholders including political entities are aware that the drop-out rate for Hispanics is the highest of all the minorities with approximately 30% leaving high school before graduation (Moule, 2012). The drop-out rate may be exacerbated due to the disproportionate concentration

of poverty in Latino communities and barrios, and certainly is further impacted by existing language barriers. Families with mono-lingual Spanish parents may struggle to help their children to negotiate the academic system and successfully achieve their academic goals (Bollin, 2007). For example, 76% of the Hispanic families in the U.S. speak Spanish at home. Use of the home language in the classroom allows students to feel secure and become successful (Chavez-Chavez, 1984; Cummins, 1994; Osterman, 2000) with misconceptions based on school culture less likely to occur (Fishman, 1996; Garcia, 2005). Thomas and Collier (1997) found that using the first language in the classroom contributes to academic success in the second language by the end of their school years. However, conversational language proficiency develops more easily usually within two years of exposure to the language. Academic language is more complex and cognitively demanding, and developing proficiency in the second language for school work requires much longer, up to five to seven years (Lucas, Villegas, & Freedson-Gonzalez, 2008).

The drop-out rate may also be tied to the difficulties Hispanic students face when attending school in districts where non-Latino, majority, racial, and ethnic groups permeate the culture. The cultural differences between the Hispanics and non-Hispanic Whites, in particular, create discrepancies between home and school culture for Hispanic students (Nieto, 2004). Further compounding the problem is the gap that exists between the racial and ethnic makeup of students and teachers (Nieto, 2004) currently, 87% of teachers are White in America's schools (Bireda & Chait, 2011). Only 4% of the nation's teachers are Hispanic, and some 40% of American schools have no teachers of color at all (National Collaborative on Diversity in the Teaching Force, 2004); overall about 13% of public school teachers are from minority populations (National Education Association, 2002).

Although teaching students within a culturally relevant context (e.g., one that bridges home and school culture) can enhance the academic success of culturally and linguistically diverse students (Christian & Bloome, 2004), the literature has well documented the practice of schools demanding that Latino students adapt to the dominate school culture created by a largely White, mono-lingual English teaching force that does not acknowledge the extent to which the curriculum reflects the White culture (Nieto, 2004; Christian & Bloome, 2005). Unfortunately, the predominantly White educators are largely unprepared to provide culturally responsive curriculum and instruction to non-white students (Nieto, 2002). Educators who do not have the same cultural perspectives of the students they teach may fail to understand or even perceive the ways that the students' culture determine their behaviors, and structure their successes and perhaps failures as well (Moore, 2004).

Risk factors within the educational system in the U.S. continue to imperil achievement in higher education, with only 13% of Hispanics completing a four-year college degree (U.S. Census, 2010) and only 8% receiving a graduate degree (Castellanos & Gloria, 2007). The literature reports that Hispanic students face many challenges not faced by non-Hispanics in their quest for a higher education, including family responsibilities, poor academic preparation, lack of resources, and unfamiliarity with the college culture (Cavazos & Cavazos, 2010; Gandara & Contreras, 2009; Immerwahr, 2003). Additional challenges reported by Hispanic students include low expectations from their high school teachers and a lack of confidence in their ability to succeed from their high school counselors (Davison-Aviles, Guerrero, Barajas-Howarth, & Thomas, 1999; Martinez, 2003). Teachers may hold stereotypical and negative opinions of Hispanic students such as a perception of their lack of ambition or their not valuing higher education (Caudraz, 2005). Hispanic students may encounter discrimination including a lack of access to resources available to non-Hispanic students, and may feel unwelcomed at school

(Martinez, DeGarmo, & Eddy, 2004). What the literature fails to detail is what happens to achievement for Hispanics and others when supporting, mentoring teachers act as buffers to the many risk factors that exist.

While the literature paints a despairing picture of the educational culture for Latinos in the U.S., high achieving, thriving Latino students exist in the system. These seemingly resilient students represent what is possible rather than what is likely. Researchers, then, should be expected to record and analyze and interpret the many driving forces that are enabling success for these resilient students, and use this information to create interventions in an effort to close the achievement gap. The term resilience is used to describe students "who sustain high levels of achievement, motivation, and performance despite the presence of stressful events and conditions that place them at risk of doing poorly in school and ultimately dropping out of school" (Alva, 1991, p. 19). Hispanic students may experience stress based on many factors including their status as a minority, discrimination from school personnel, and attendance at schools that do not reflect their own culture, their low socio-economic status, and the inability of their parents to support their education because of language barriers or lack of understanding (Gonzalez & Padilla, 1997).

The purpose of this study is to examine what factors may be contributing to the academic resilience of a sample of Hispanic students enrolled in Family and Consumer Sciences degree programs at a major Southwestern Hispanic-serving (HSI) land-grant university located near the American-Mexican border. These students are defined as resilient based on their continued successful enrollment in, and completion of, university classes despite having several of the known risk factors that cluster epidemiologically in the population of Latino college students (Campa, 2010; Sanchez, Colon, & Esparza, 2005).

Review of Literature

Although colleges and universities are experiencing an increase of Hispanic students whose first language is Spanish (Eitel & Martin, 2009), research studies have been few on what this population needs to be successful. Many of these students are first generation college students and also may be first generation citizens, so challenges at college include a lack of knowledge about college and information on the culture of a college environment (United States Presidential Advisory Commission, 2003). The students may feel overwhelmed and frustrated trying to navigate the unknowns of the college process (Trujillo & Diaz, 1999), because they likely do not know anyone who has attended college (Valenciana, et al., 2006). Their English skills may put them at a disadvantage, since English is their second language. Their financial situation may be a factor, which might require them to work long hours in order to finance school and provide for their families (Fry, 2002). Unfortunately, due to lack of expectations from their high school teachers and counselors, they may not be academically prepared for college work (Campa, 2010).

Although the literature has primarily looked at Hispanic students from a deficient model, this study looks at the resilient Hispanic students who are succeeding in a large land-grant university. The study looks for indications of ways in which they are successful at navigating higher education in an attempt to provide information to other programs to replicate their successes. In particular, we were interested in the high-school-to-college transition and attempted to find any conduits that we could exploit to improve the odds of the students' success. In addition, we had a particular interest in finding such avenues to success so that we could continue to update our teacher education curriculum and give our pre-service teachers the

necessary knowledge and tools to deal effectively with situations they will encounter in their classrooms.

For example, a sense of belonging to one's community is a basic human need (Maslow, 1970). School belonging describes the way students feel in the school—with the optimal result that the student feels accepted, respected, and valued by peers and teachers. This feeling of belonging to the community of the school appears to contribute to the motivation and ability to achieve academically for middle and high school students. The construct has been linked to motivation and achievement in middle and high school students (Goodenow, 1993). Several other studies have linked school belonging and other school behaviors leading to success (for example, see Anderman, 2003; Brand, Felner, Shim, Seitsinger, & Dumas, 2003). One study noted that a sense of belonging was a significant predictor of academic performance for Mexican-origin high school students (Gonzalez & Padilla, 1997). Another showed that a low sense of belonging was linked to low grade achievement (Smerdon, 2002). Gender differences in sense of belonging have been found with girls reporting a greater sense of belonging in both middle and high school which may contribute to their higher academic achievement (Goodenow, 1993; Goodenow & Grady, 1993; Sanchez, et al., 2005; Smerdon, 2002).

Dewey (1958) was the first to suggest that teachers are responsible for creating a nurturing and respectful learning environment for their students—an environment that allows all students to feel that they are liked, supported, respected, and that they can achieve academic success. In Goodenow's (1993) study of middle-school students, students reported their perceptions of the support, interest, and respect they received from their teachers was the most influential single component of belonging and support leading to effort and achievement. Goodenow found gender differences in her study, with girls reporting a greater significance in teachers' support.

Some evidence suggested that the sense of school belonging tends to decline among students throughout their school years (Anderman, 2003), and that teachers' influence on school belonging for students declined as well (Morrison, Cosden, O'Farrell, & Campos, 2003). A few studies have examined college populations with one study linking class belonging with motivation and achievement (Freeman, Anderman, & Jensen, 2007).

In summary, this study examined factors that may be contributing to the academic resilience of Hispanic students enrolled in Family and Consumer Sciences degree programs at a major Southwestern HSI land-grant university located near the American-Mexican border. This article continued the work of Goodenow and others, and reported on the contribution of high school teachers to these students' feelings of school belonging in the university level.

Methods

Data were collected using a standard survey. The survey was distributed online and participants were solicited via email on common list serves from a Southwestern, Hispanic-serving institute (HSI). All participants were required to read an informed consent document and therefore participation was of a voluntary nature.

Sample. The sample consisted of 80 Hispanic female students. Age for the sample ranged from 18-58. The average age for the sample was 27.3 (8.4) years.

Marital Status. It was recorded and the data indicate that most students were not in a committed relationship (28%), followed by married (24%), committed relationship (21%), cohabiting (20%), divorced (3%), and widowed (3%). Therefore, a broad range of familial relationship types were represented in this sample.

Work. This was recorded as the number of hours per week that participants performed in a paying job. The average hours worked for the sample was 19 (16.7). The range of hours worked was from 0-42. This indicates that on average, the students in this sample worked half-time in an employment setting.

Income. This demographic item was found to be approximately $23,000($16,000) on average for participants. The range of income was from $0-51,000 for the sample. The average was appropriate given the average household income for the county; however, the average may be high for a traditional college sample. Respondents were asked to indicate their household income when they were in high school and had four options from which to choose. The distribution of their recollection or perception of their household income was as follows: poverty (8%), low income (38%), middle income (51%), and high income (3%). This distribution would indicate that the majority of the sample was financially well-off and this should be considered when generalizing results to other samples.

Children. Nearly 51% of the sample did not have children. For those participants who were parents, the average number of children per participant was 2 (1.4). This average indicates that the majority of parents in the sample had 1-3 children. However approximately 17% of the sample had three or more children and the figure doubles (34%) when looking at only the parents in the sample.

GPA. This item was collected as a self-report item in the survey and was recorded for high school and for current (college) performance. In terms of high school GPA, respondents reported that 19% had GPAs between 4.0-3.76, followed by 25% with GPAs between 3.75-3.5; 32% with GPAs between 3.49-3; 18% with GPAs between 2.9-2.5; 5% with GPAs between 2.49-2.0; and finally 1% reported GPAs below 2.0. College GPA was also recorded. Respondents reported that 21% had college GPAs between 4.0-3.75, followed by 14% with GPAs within the range of 3.74-3.5; 39% reported GPAs between 3.49-3.0; 16% reported GPAs between 2.9-2.6; 10% reported GPAs between 2.5-2.0 and no one reported a GPA below 2.0 (See Figure 1).

Educational aspiration. This was recorded by asking what the highest level of education respondents planned on pursuing. Figure 2 shows the results from three sources. The first is students' own ambitions and the second are their perceptions of their parents' wishes for their child's academic accomplishments in terms of highest level achieved. The figure indicates that a small portion of the students believed that their parents did not desire them to achieve the level of education that they are currently pursuing. However, at the doctoral level, participants reported that more of their parents aspired for them to achieve a doctoral degree than students actually aspired to do so. A markedly smaller number of fathers than mothers were reported to have aspirations for their children to gain a master's degree. Although numerical differences exist, the pattern of differences does not indicate any trend by parental figures, nor level of aspiration. Specifically, in some cases more students reported that mothers supported their aspirations, while in other cases students reported receiving more support from their fathers. However, differences are too small to infer meaning.

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Figure 1. GPA for High School and College

Figure 2. Academic Ambition by Source
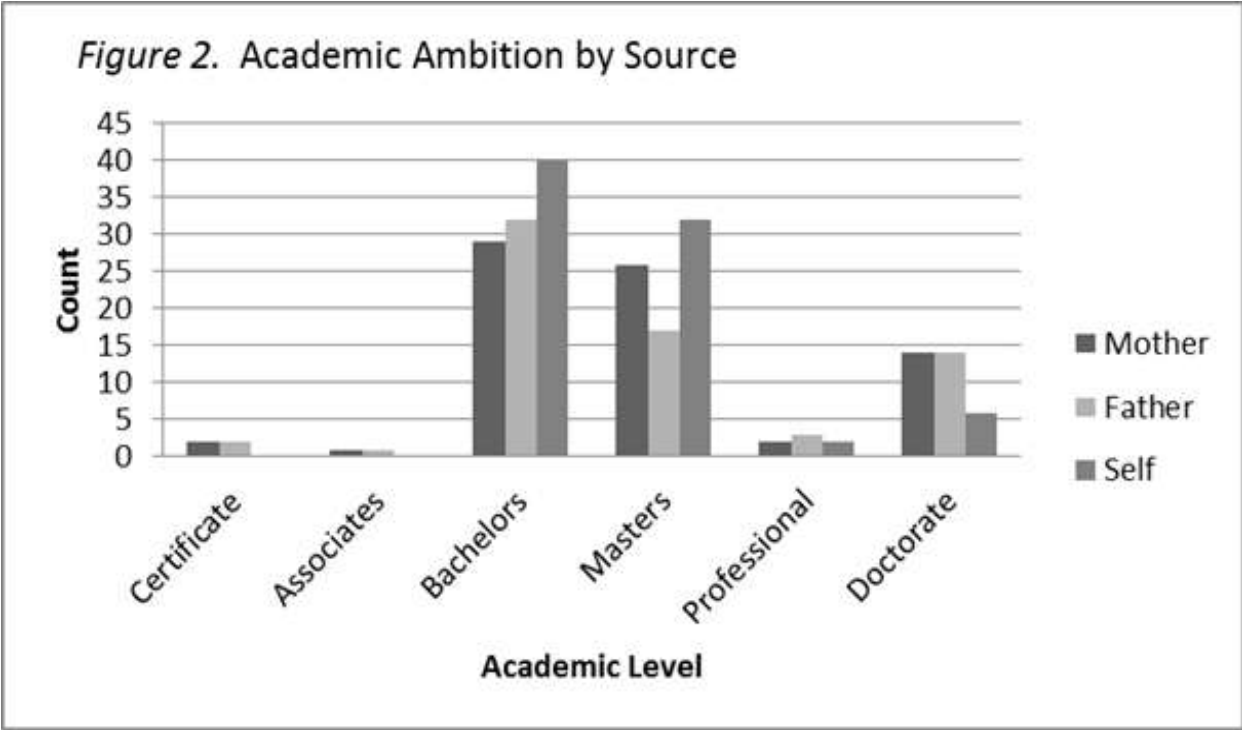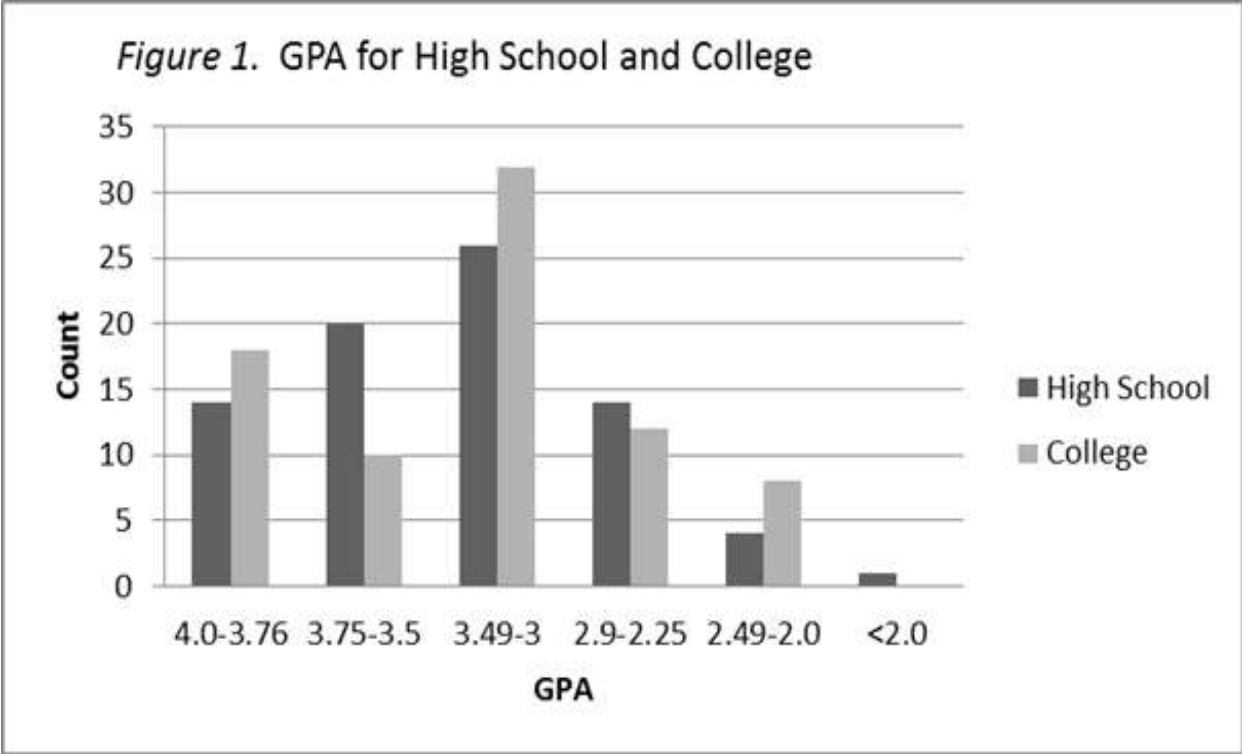
Note. Columns for Self in Certificate and Associates categories were intentionally excluded because the N for self was zero in both occasions.

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Survey Results

Teacher-student relationship was measured using a 12-item inventory where respondents were asked to respond to statements using a 3-point scale. Responses were coded so that "mostly false" was 0, "sometimes" was 1 and "mostly true" was 2. Therefore the possible range of scores was from 0-2. Lower scores indicated a less than desirable relationship with teacher and higher scores indicated a healthy, supportive relationship with teacher. Reliability analysis indicated that the scale had a high degree of reliability (alpha=.85) with the 12 items. Therefore, the sum of all items was used to create a scaled score. Average scores across items are listed in Table 1. The range of average item scores was from 1.12-1.84. The range of scores for the scale were from 6-24 and the average score for the summative scale was 19.47(4.49).

Table 1
Item Statistics for Teacher Scale

Item	Mean	Standard Deviation
My teachers cared about me.	1.64	.607
My teachers made learning fun and interesting.	1.40	.615
My teachers helped me when I didn't understand.	1.65	.560
My teachers really listened to what I had to say.	1.49	.645
Most of the teachers and other adults I knew at that school liked me.	1.20	.405
My teachers had extra work to do for students who wanted to learn more about something.	1.12	.788
My teachers treated me fairly.	1.71	.487
My teachers liked their work. They liked to teach.	1.53	.646
I was able to do the work my teachers asked me to do if I tried.	1.84	.369
My teachers made me feel good about myself.	1.65	.557
I could talk to my teachers about private things.	1.64	.607
My teachers believed that I could learn.	1.40	.615

School belonging was measured using 15 items listed in Table 2. Respondents were asked to answer using a five-point Likert-type scale from strongly disagree to strongly agree. Responses were coded so strongly agreeing yielded a higher score than disagreeing. Therefore a high scale score is indicative of a higher level of school belonging. Reliability analysis yielded results indicating a strong level of internal consistency (alpha=.828), therefore scaled scores were deemed appropriate to use in statistical analysis. The range of average item scores was from

2.75-4.29 and the possible range of scaled scores was from 15-75. Given that, the average score for the summative scale was 56.65(7.94).

Table 2
*Item Statistics for School Belonging*

Item	Mean	Standard Deviation
I feel like a real part of *university*.	3.93	0.998
People here notice when I am good at something.	3.57	1.037
Other students at *university* take my opinions seriously.	3.39	0.899
Most professors at *university* are interested in me.	3.54	0.930
Sometimes I feel like I don't belong here.	3.56	1.276
There's at least one professor or other adult at this school that I can talk with if I have a problem.	3.84	1.066
People at *university* are friendly to me.	4.16	0.834
Professors here are not interested in people like me.	3.83	1.088
I am included in lots of activities at *university*.	2.77	1.258
I am treated with as much respect as other students.	4.24	0.728
I feel very different from most other students here.	3.24	1.228
The professors here respect me.	4.23	0.628
People here know I can do good work.	3.99	0.814
I feel proud of belonging to *university*.	4.30	0.849
Other students here like me the way I am.	4.13	0.789

Note. The Name of the university was replaced with the word "*university*" to protect participant confidentiality

Prediction Model

In order to test the hypothesis that teacher-student relationship in high school was a significant predictor of school belongingness in college, a predictive model was developed with teacher relationship as the predictor and school belongingness as the outcome. A linear regression analysis was used to accomplish this statistical task. In the analysis, teacher relationship was entered as the independent variable and school belongingness was the dependent variable. These were summative scaled scores and higher scores indicated a better relationship with teacher and better belonging at college. Figure 3 shows the relationship in a scatter plot with a linear regression line fit to the data. The analysis shows that there is positive

relationship between teacher relationship and belonging in college. The strength of the relationship is .50 and statistically significant (r=.476; p<.001). In addition, the R-Square value

Figure 3. Relationship with HS Teacher Predicts School Belonging
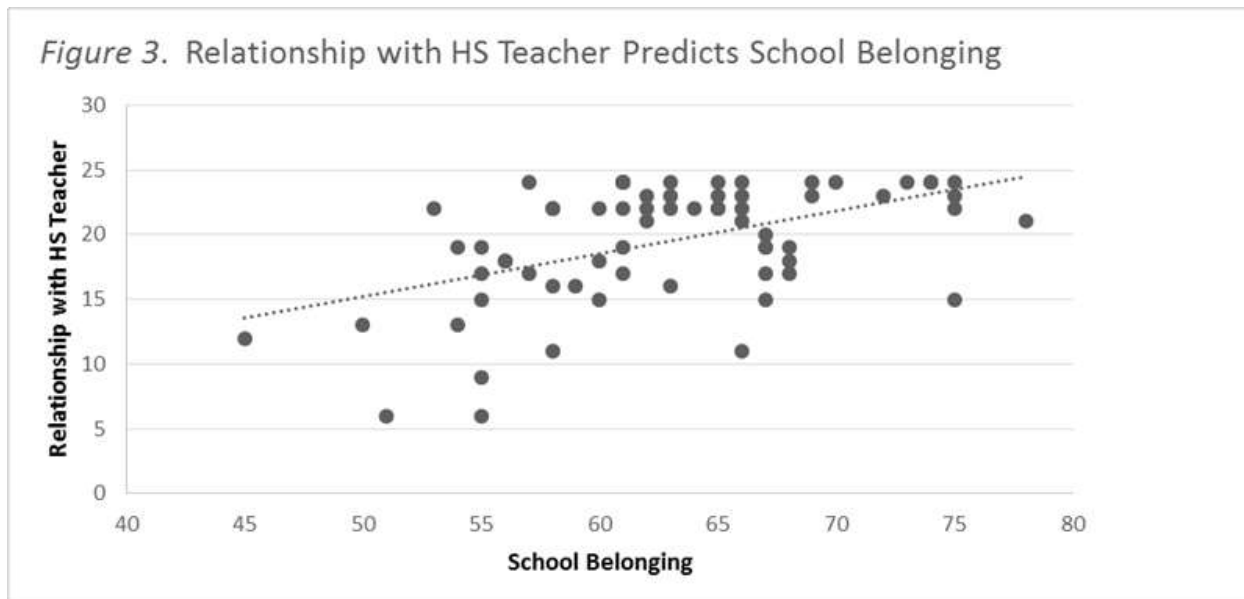
for the regression is .226 (p<.001) indicating that nearly one-fourth of the variance in school belonging at college is explained by the relationship with high school teacher. Although this leaves a significant proportion of the variance to be explained by other important variables, the unique contribution of relationship with students in high school from at least one important teacher appears to be a very important component of student success in college.

Discussion

The study extended the literature on how Hispanic students' relationships with their high school teachers impacted their academic resilience at the university level. Although some researchers have found that school belonging tends to decline among students as they negotiate the education system (for example, Anderman, 2003; Morrison, et al., 2003), for the students in this study, the relationship with their high school teachers contributed significantly to their feeling of school belonging at the university level, which perhaps has led to their academic successes at the university.

Many implications of the results directly relate to the literature and to the practice of family and consumer sciences. Much of the literature speaks to the need for culturally competent teachers who can develop culturally responsive curriculum that allows all students to feel included and successful in the classroom (Cartledge & Kourea, 2008; Richards, Brown, & Forde, 2007). One of the outcomes of this positive learning environment was evidenced in this study. Students who reported having a healthy, supportive relationship with their secondary teachers were able to transfer that feeling of belonging to the university level, perhaps contributing to their academic successes. From a systems perspective, one would assume that if feedback loops between teachers and students are present, and the environment demands that students perform well in school and are rewarded for such performance, higher levels of cooperation and positive affect are achieved for everyone involved. These unspoken norms, in turn, are the catalyst for the development of cognitive schemata about how students should act, feel, think, and respond in

academic environments. These internalizations are believed to be the underlying reason that the strong statistical relationship was found in the analysis of data in the current study. In addition, the idea is strengthened that the relationship between teacher and student may be equally important as the content of the class being taught, in terms of long-standing academic success for Latino students.

Teacher educators should educate their pre-service teachers about the benefits of a positive inclusive learning environment and how to develop such an environment in their own classrooms when they begin to teach. But as importantly, teacher educators should model for their university students how to develop and maintain such an atmosphere in the classroom. Developing the supportive relationship with students at the university level may serve to not only teach those students how to create such an environment, but could also serve to retain at-risk students in programs. Teacher educators have the opportunity to create that supportive learning environment in their own classrooms and foster the development of such a learning environment in the classrooms of the future.

All teacher educators can benefit from receiving information about dominant cultural attitudes and beliefs that can affect Mexican American students' ways of knowing and being in academic settings. Further, teachers can learn how to develop and provide culturally responsive teaching strategies for Hispanic students so we can better serve this population. Some educators may not be aware that they are contributing to the problem by not providing culturally relevant context to their ethnically and linguistically diverse students (Taylor, 2010). Others may be aware but may be lacking proper training on how to effectively intervene. Providing meaningful multicultural education to educators which leads to a personal and professional transformation is required to adjust the current European American teaching pedagogy to accommodate diverse learners and foster their achievement and success.

Administrators must commit to develop cultural diversity in their school systems by actively recruiting faculty of cultural and ethnic diversity, providing transformative learning experience to their existing staff on the unique needs of culturally diverse students, and openly demonstrating support for students of all cultural backgrounds by creating opportunities for ethnic activities. Sensitivity training and cross-cultural training should be frequent and ongoing elements of professional development for all college personal.

In conclusion, although the research on academic resiliency for Hispanic students is still in the developing stages, certainly all avenues must be explored. This study supported using a model that examined factors contributing to academic success in the Latino population rather than utilizing a deficit-based model; understanding how some Hispanic students achieved academic success gives educators a window for shaping instruction in a fashion that supports academic resiliency in the growing Latino population. For example, one piece of this puzzle appears to be indicated by the results of this study: high school teachers, because of their development of positive learning environments for their Hispanic students, were able to foster a sense of belonging at the university level, perhaps leading to the academic resiliency of these students.   This indicates the potential for the developmental canalization of academic success and points to interpersonal relationships between students and faculty as one conduit for this developmental phenomenon to be initiated.

Limitations

The findings are limited because they are based on self-report data collected at a single point of time. Students were asked to report on their perceptions of how their high school teachers perceived them and the relationships they remembered having with their high school

teachers. They were asked to respond to statements about their experiences at the university and how they felt about their social interactions with their professors and other adults associated with the university. There may be some other effect impacting their sense of belonging which was not captured in the current data. The subjects were female. Due to the nature of sense of belonging, a gender effect is predicted. However, this gender effect was not tested by the current study. Additional research would benefit from larger samples including subjects of both genders and perhaps comparison with non-Hispanic university students.

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Citation

Will Culinary Videos Increase Dietetic Students' Culinary Skills and Food Knowledge?

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The food and foodservice industry are one of the largest growing areas for employing Registered Dietitians (RD). High growth rates are anticipated in a number of non-traditional areas for RD. There is justification for requiring culinary skills in dietetic training as knowledge of food and food preparation play a role in all areas of dietetics. The purpose of this pilot study was to determine if the inclusion of basic culinary technique videos in a college Advanced Foods class would improve student culinary skills and food knowledge. The results of this study indicate significant improvement in test scores for the class viewing culinary videos. The results of this study are beneficial for Dietetic Educators and Family and Consumer Sciences teachers.

There has been an ongoing national trend where speed and convenience in food preparation is essential (Jarratt & Mahaffie, 2007). Wide generational differences display varying behaviors around food, and differing attitudes about food, nutrition, and wellness (Jarratt & Mahaffie, 2007). In addition to these needs, consumers want pure, natural, healthful, and safe foods (O'Sullivan Maillet, 2002; Rhea, 2012).

The industry is being pressured to develop these foods (Jarratt & Mahaffie, 2007; Rhea, 2012) as consumers drive the demand. Increasingly Registered Dietitians (RD) are assisting the food and foodservice industry to meet this growing demand. RDs with backgrounds in food science and culinary arts are involved with formulating food products and in developing innovations in foodservice (Nyland, 2012; O'Sullivan Maillet, 2002; Rhea, 2012). RDs should prepare themselves to be leaders in food industry and food service operations (Rhea, 2012).

There is strong scientific justification for requiring culinary skills in dietetic training (Begley & Gallegos, 2010; Accreditation Council for Education in Nutrition and Dietetics (ASEND), 2007; Schaeffer & Miller, 2012) as knowledge of food and food preparation play an important role in all areas of dietetics (Long & Barrett, 1999). For example, RDs in public health programs often instruct school teachers, perform culinary demonstrations, and assist in menu planning for families (O'Sullivan Maillet, 2002). Educators have identified a decrease in students' proficiency of culinary skills (Canter, Moorachian, & Boyce, 2007; Schaeffer & Miller, 2012). The purpose of this pilot study was to determine if the inclusion of basic culinary technique videos in a college Advanced Foods class would improve student culinary skills and food knowledge.

Literature Review

Dietetic Educators (DE) are continually challenged to incorporate more information about food, nutrition, and management into their classes in order to enhance the competence of entry-level dietitians (Marsico, Borja, Harrison, & Loftus, 1998; Scheule, 2000). Julia Child, a well-known chef who made "cooking from scratch" accessible to the average person, confirms all dietitians should be able to cook. Mrs. Child stated, "It is essential that every dietitian and

nutritionist also be a reasonably good cook, and that the culinary arts be a fundamental part of their curriculum" (Canter et al., 2007, p. 315). "ADA's vision is for members to be the most valued source of food and nutrition services" (Short & Chittooran, 2004, p. 1602). Rhea (2012) indicates revisions in dietetics curriculum will be necessary to prepare students for industry changes, including the need for increased food science and food knowledge.

One of the goals of DE is to be creative with methods to develop culinary skills in their students while teaching knife skills, healthy cooking methods, and increasing food familiarity (Canter et al., 2007). Many university programs do not have adequate facilities for teaching food classes (Canter et al., 2007) and purchasing and maintaining industrial cooking equipment and the expense of food and supplies can be cost prohibitive. Researching alternative solutions to teach these skills to students, while controlling costs, is imperative. Utilizing a video series aimed at food preparation and culinary skills in addition to culinary classes may be one solution to this challenge (Schaeffer & Miller, 2012).

However, according to Levy and Auld (2004) the impact of demonstrations on student learning will likely be weaker than cooking classes. They also indicated the use of videos rather than hands on culinary classes will have less of an impact. In contrast to Levy's position, Jackson, Helms, Jackson, and Gum (2011) indicate technology-enhanced pedagogies are becoming more evident in the classroom. The National Education Technology Plan stated technology should assist students in understanding difficult concepts, help students to engage in learning, provide students with information and resources, and meet students' individual needs (Redmann & Kotrlik, 2004). DE should consider utilizing various teaching methods in the classroom (Fox & Roberts, 1993; Mitchell & Nyland, 2005; Palermo, Walker, Brown, & Zogi, 2009).

Technology: What's best for Dietetic Students?

Jackson et al. (2011) suggested students exposed to extensive visual input during childhood may have differing expectations with regards to learning. These students consider technology an enhancement or necessity as part of learning, and prefer visual images to traditional learning styles (Jackson et al., 2011). In 2006, 639 college students participated in a study to determine their expectations in the classroom: 81% anticipated classroom presentations that were technology-enhanced, 45% expected occasional computer simulations, and 52% expected the utilization of videos and DVDs (Jackson et al., 2011). When comparing technology enhanced pedagogies to those pedagogies with no technology, more students from the technology enhanced pedagogy wanted to see DVDs and simulations (Jackson et al., 2011).

Rudi (2012) identified children from the current generation as "Digital Natives" and referred to blending online tools and traditional teaching methods in the classroom as hybrid curriculum. This type of instruction is also termed blended learning, mediated learning, or web-enhanced instruction and seems to combine students' love of technology and the need to belong (Glass, 2003). To accommodate the needs of this generation, many educators are reflecting on their current pedagogies and are trying new approaches (Ertmer, Ottenbriet-Leftwich, Sadik, Sendurur, & Sendurur, 2012). By utilizing hybrid curriculum, the teacher is still vital in the classroom while using the computer as a tool of instruction (Rudi, 2012). Hybrid curriculum is research-based and is validated by student pass rate increases (Rudi, 2012).

Anderson and Perry (1994) found the most appropriate technology must be incorporated in a natural manner into the classroom to give students equitable access to the benefits of technology. Technology should not be integrated into the classroom for the sake of using

technology; it should enhance the instructional content objectives (Hora & Holden, 2012; Kotrlik & Redman, 2009). The pedagogy must also be true to the instructor's teaching philosophy (Ertmer et al., 2012; Hora & Holden, 2012; King, 2012; Wood, 2011) and increase student learning (Ertmer, 2005).

Short and Chittooran (2004) surveyed DE asking about changes they had implemented in the classroom in the past 5 years. They indicated an increased use in technology, changes in teaching methods, and an increased need for hands-on teaching experiences. The DE expected to increase their use of technology, change teaching methods, and change student projects. The DE identified increased use of technology, changes in nutrition education mediums, and interactive lessons as major trends (Short & Chittooran, 2004). The instructional mediums currently utilized by the DE were lecture (88%) and demonstration (71%). By using creative approaches to incorporate new resources, the DE can enhance students' learning (Dexter, Doering, & Reidel 2006).

Some educators are hesitant to implement technology into the classroom (Glass, 2003). Reasons for this hesitation are attributed to lack of understanding technology, concern over possible job elimination, fear of the unknown, and fear of change (Bitner & Bitner, 2002; Glass, 2003). Concerns surrounding skill level of technology use can be a barrier for educators, as well as lack of technical support, and time constraints for implementation (Kotrlik & Redmann, 2009). Brinkerhoff (2006) noted additional barriers such as training, personality factors, and anxiety. Wood (2011) found higher education faculty felt technology could be a useful tool in the classroom, however, they felt they did not have adequate computer support from their institutions.

Glass (2005) stated educators need to embrace the change and update their pedagogies, because, "the teaching of culinary arts has gone hi-tech" (Glass, 2005, p. 6). One reason DE do not implement technology is the length of time required to develop online courses or video-tape instructional materials (Hora & Holden, 2012; Jarvis, 2004). However, teaching courses online or utilizing videos can make physical resources, in this case instructional kitchens, more accessible or available and would be economical and increase facility usage (Glass, 2005; Jarvis, 2004). Canter et al. (2007) suggested a faculty member could develop a video of a virtual institutional or commercial foodservice operation.

An alternative approach to hybrid education was developed by Warmin, Sharp, and Condrasky (2012) where college age students participated in a culinary nutrition program with a chef and a Registered Dietitian. Classroom materials included basic cooking methods, knife skills, flavor combinations, and variety when creating menus. Participants reported they could perform cooking skills at a higher level at the conclusion of the program. The nutrition component of the study was online. Due to the significant increase in participant posttest scores, the researchers suggested considering an online cooking component in addition to the nutrition component in the future as well (Warmin et al., 2012).

Further possibilities include the use of haptics where students, using a Food Simulator, put a device in their mouth and capture the force of real food and experience the auditory and chemical sensation experiences when eating food (Glass, 2005). Although this technology sounds like science fiction, it is presently being developed. Other possible technologies include: streaming video, classroom-response systems also referred to as clickers, and web-based simulations (Hora & Holden, 2012).

Forms of Technology: Streaming Video and Online Tutorials

Streaming video is a popular and cost effective way of using technology in the classroom. Strom (2002) examined the utilization of streaming video, or Click and Go Video, which provides the DE the opportunity to enhance the classroom experience for students. He emphasized current methods of creating streaming video as no longer cost prohibitive, time consuming, or necessitating a professional videographer. One example given was the utilization of streaming video for teaching catering in a hospitality program. Video clips integrated recipes and instructional information with cooking sessions. The goal of the videos was to prevent the educator from repeating demonstrations, allowing the educator to engage in more supportive work with the students (Glass, 2005; Shah, George, & Himburg, 1999; Strom, 2005). Educators from the department performed the demonstrations in the video. Adequate lighting was a challenge during the taping sessions to ensure cooked food looked appetizing and were appropriate colors. Sound needed to be monitored carefully as the running compressors in the kitchen often overshadow the appropriate sounds in the recording (Aase, 2008). One disadvantage of this technology includes the lack of a live educator. If a student has questions, the video will not answer them and viewing a video repeated times may not give students a better understanding of the material (Glass, 2005).

The challenge for academia is how to use streaming video in ways that are pedagogically appropriate and meet their students' learning needs (Strom, 2002). Utilization of technology allowed lectures to be viewed online and class time was spent conducting learning activities. This allowed students' time to practice skills and develop a deeper understanding of course concepts. Classroom activities would allow the students to apply what they had learned. Students anticipate being active participants in their learning (Dornan, Hadfield, Brown, Boshuizen, & Scherpbier, 2005).

Maintaining professional credibility in dietetics includes staying current with new trends, including the use of technology as it is an expected curricular change (Short & Chittooran, 2004) and aligning technology with dietetics practice is essential (Hora & Holden, 2012). "The ultimate goal of education and research in 2017 is to position the dietetics practitioner to best provide what the customer wants – good food and good health" (O'Sullivan Maillet, 2002, p. 1405). It is becoming more apparent that increased utilization of e-learning and technology in the classroom could be a sensible solution to the current demise of cooking skills of dietetic students.

The purpose of this study was to determine if the inclusion of basic culinary technique videos in a college Advanced Foods Class would improve student culinary skills and food knowledge.

Methods

At a Midwestern university, in an Advanced Foods Class with two sections, the students were asked to participate in a study about food knowledge and culinary skills. One section watched a set of culinary videos in addition to the normal classroom curriculum and will be referred to as Classroom Plus. The second section had normal classroom curriculum and will be referred to as Classroom Only. All students in the two sections of the same course agreed to participate in this study and signed consent. They were told that all data collection would be reported in aggregate with no student identifiers.

The Classroom Only section consisted of 14 students taking the Advanced Foods Course. The Classroom Plus consisted of 20 students who were assigned to view four culinary videos

produced by a national culinary school. The videos were available both in the classroom and at the university library. Students were expected to view these on their own time which took approximately six hours. The list of videos is found in Table 1. The students were assigned to view the videos by the end of the semester.

Table 1.
Required videos and length of viewing time.

Video	Viewing Time
Knife Knowledge	120 minutes
Dry Heat Volume One	90 minutes
Dry Heat Volume Two	90 minutes
Moist Heat	90 minutes

During the first week of the semester all students were given a pretest of food and culinary knowledge and a posttest identical to the pretest was administered the last week of the semester. The pre/posttest questions can be found in the Appendix. While scores were given to the students, correct answers were not shared.

Test questions accompanying the video series were selected for the pre/posttest. The desired knowledge and skill level of dietetic students, curriculum guidelines and Knowledge Statements for Dietetic Students from the Academy of Nutrition and Dietetics were utilized when selecting questions (ACEND, 2012). To validate the test, six DE from the university took the test and questions were adjusted in regards to content and wording before being administered to the students.

Statistical data were analyzed descriptively. T-tests were used to estimate differences on pre and post-test scores to identify food knowledge and culinary skills.

Results and Discussion

The results of this study showed improved test scores between pre and post tests for the Classroom Plus and Classroom Only students as shown in Table 2. There were no significant differences on the pretest scores for students in the Classroom Plus or Classroom Only.

Table 2.
Difference in Pre and Post Test Scoring for Students in the Classroom Plus and Classroom Only Sections.

	Pretest Mean	Posttest Mean	T(df)	Significance
Classroom Plus	17.70	21.70	-3.87(19)	$\leq$.001
Classroom Only	19.21	20.93	-2.4(13)	.03

The Classroom Only section demonstrated significant learning from pre to posttest which was attributable to the course curriculum. There was a significant difference in posttest scores for the Classroom Plus section compared to the Classroom Only section. It appears that the inclusion of culinary videos in an Advanced Foods Class significantly enhances student learning.

Conclusions, Limitations and Applications

Conclusions

A set of videos designed by a culinary institute for teaching food enthusiasts was used to augment classroom curriculum for an Advanced Foods Class. Culinary skills and food knowledge varies among dietetic students (Schaeffer & Miller, 2012). When comparing two sections of the same course with a consistent curriculum, and adding culinary videos to one section, food and culinary knowledge for those students was significantly enhanced.

Results of this pilot study will assist professors in making pedagogy decisions when developing or adjusting dietetics curriculum. One of the advantages of equalizing the cooking skills and food knowledge of the students using videos outside the classroom is the additional face to face class time that can be utilized in educating the students on other topics or more intense learning of advanced skills. In addition, the introduction of technology in the classroom such as videos would be both cost effective for the university and convenient for the student.

Limitations

Several limitations of this study were noted. The appropriateness of the current videos may have been too advanced for this course. Feedback from the students suggested development of a specialized set of videos which could be more applicable to the practice of dietetics than the culinary school videos which were more advanced and specialized. Another limitation of the study was student motivation and time to view the videos. This was a result of copyright laws since posting the videos on any viewing sites was prohibited.

Applications

Online posting of DE produced videos would decrease the inconvenience for students having to watch the videos in the library or classroom. The DE could develop a video illustrating demonstrations and return demonstrations performed by dietetic students teaching each other culinary skills. This is an area for further development and future research studies.

Another possibility would be developing a study abroad program or a summer on campus cooking class. In a study conducted by Sasson, Black, and Dalton (2007) students participated in an Italian study abroad program for three weeks. They were instructed on cooking, shopping, tasting food, and eating. More than 50% of the participants reported increases in the number of meals and variety of foods they were preparing at home, and an interest in improving their cooking skills. Eighty percent of the participants reported an increase in the amount of time spent on cooking, eating, and enjoying food (Sasson et al., 2007). This research concept could possibly be developed and used for an on campus program emphasizing the same focus areas (Canter et al., 2007) and the course could be taken before the Advanced Foods class. This research is also applicable to Family and Consumer Sciences teachers with strategies to be more effective educators in their classrooms.

The Academy of Nutrition and Dietetics, along with the late Julia Child concurred that all dietetic students should develop culinary skills and be knowledgeable about food and food preparation. It is the responsibility of the DE to prepare each dietetic student for the challenges they will face as an RD regardless of their specialty. The introduction of new technology in the classroom will help achieve this goal and further prepare dietetic students for changes in the food industry.

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Appendix
Pre/Posttest

True/False Questions
1. When grilling and broiling white meats, they should be cooked through, but not overcooked.
2. Grilling is best used for less tender cuts of meat which require high heat.
3. Carryover cooking refers to the fact that foods continue to cook even after they have been removed from the heat source.
4. Broiling is a technique used to cook foods where the heat source is located below the food.
5. Pan gravy is a sauce used in roasting that is made with a roux that incorporates fat rendered from the roast.
6. Broiling is a technique used to cook foods where the heat source is located above the item to be cooked.
7. When steaming, the steaming vessel should remain open.
8. The final internal temperature for poultry is 165°F internal.
9. When braising, the main item should be completely covered by the cooking liquid.
10. Foods that have gone through the standard breading procedure should not be stacked.
11. Pan-fried items may be finished in the oven to complete cooking.
12. Recovery time is the amount of time it takes the oil to return to the proper temperature after an item is cooked.
13. Should a piece of meat be removed from the oven when the internal temperature is lower than the desired doneness?

14. One of the differences in braising and stewing is the size of the main item. Braising uses portion size or larger cuts while stewing uses bite size pieces.
15. To release the drippings from the bottom of a pan by adding liquid and stirring is called fond.

Multiple Choice Questions
16. Allowing an item to rest after it has roasted
    a) Will give the cook time to prepare the rest of the meal
    b) Is an optional techniques
    c) Stops the carryover cooking of the roast
    d) Redistributes the juices that have accumulated in the center of the roast
    e) None of the above
17. A technique used to cook foods on the top of the stove in a cast iron or other heat-resistant metal pan over intense heat.
    a) Broiling
    b) Spit-roasting
    c) Barbecuing
    d) Pan-roasting
    e) Grilling
18. A technique that cooks foods by surrounding them with dry air in a closed environment
    a) Roasting
    b) Broiling
    c) Barbecuing
    d) Poêléing
    e) Grilling
19. Examples of steaming liquids include:
    a) Water, beer, or oil
    b) Wine, stock, or butter
    c) Stock, court bouillon, or oil
    d) Water, stock, or wine
20. Moist-heat techniques include:
    a) Sautéing, steaming, or poaching
    b) Sautéing, braising, or roasting
    c) Steaming, shallow poaching, or deep poaching
    d) Frying, steaming, or smoking
21. Cooking liquids associated with poaching include:
    a) Water, wine, or oil
    b) Beer, oil, or water
    c) Vinegar, citrus juice, or butter
    d) Stock, wine, or vinegar
22. When preparing a stew, it is best to thicken the sauce
    a) Just before serving
    b) After the vegetables have been cooked and before the liquid is added
    c) After the main item is fully cooked and all the solid ingredients have been removed
    d) Once the stew has been taken off the direct heat and cooled slightly
    e) a or b

23. Food items to be stir-fried are
    a) Cut into portion-size pieces
    b) Usually breaded, using the standard breading procedure
    c) Always blanched to shorten their cooking time
    d) Cut into bite-size pieces, which acts to tenderize the food
    e) None of the above
24. The most important consideration in choosing oil for deep frying are
    a) Neutral flavor and color and low smoke point
    b) Fatty acids, flavor, and glycerin
    c) Well-developed flavor and color and a high smoke point
    d) Neutral flavor and color and high smoke point
    e) None of the above
25. The standard breading procedure usually does not include
    a) Breadcrumbs
    b) Eggs
    c) Flour
    d) Seasonings
    e) Arrowroot or cornstarch
26. Which cooking medium is best suited for deep frying
    a) Olive oil
    b) Seasoned oils
    c) Vegetable oils
    d) Butter
    e) Lard
27. The most reliable method for determining doneness in roasted items is to use a(n)
    a) Instant read thermometer
    b) Oven thermometer
    c) Color chart indicating doneness
    d) Timing cooking time in relation to weight of meat
28. Which of the following are used to thicken stews or braises
    a) Flour and starch
    b) Slurry and a reduction
    c) Pureed Vegetable
    d) All the above
    e) None of the above
29. The three things used to evaluate the quality in sautéed items are
    a) Flavor, texture, color
    b) Crispness, color, cut
    c) Texture, color, freshness
    d) None of the above

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