Texas Community Colleges and Female Faculty Members: A Longitudinal Analysis*

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1 Introduction

According to the American Association of Community Colleges, females constituted over 58% of all community college enrollments in 2008. In Texas, the percentage mirrors the national data with females representing 58.6% of all 2-year college enrollments (THECB, 2009). The community college is the principal educational resource for adult women. This population makes up the largest single segment of the student body at this type of higher education institution (White, 2001). To explain this phenomenon, researchers have focused on the appeal of community colleges to the female student. The community college is more likely to offer supplemental programs such as variable class schedules, extended child care, single-parent programs, women's centers, low tuition, and neighborhood locations (Hagedorn & Laden, 2002). Thus, the presence of female faculty members at community colleges becomes more important as role models for this portion of the student body. As stated by Trower and Chait (2002), "Who teaches matters. In fact, the most accurate predictor of subsequent success for female undergraduates is the percentage of women faculty at their college" (p. 33).

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Women have made substantial advancement in entering the faculty pipeline in colleges and universities in the United States. In 2005, women accounted for 41% of full-time faculty across all types of colleges and universities (Snyder, Dillow, & Hoffman, 2008). However, the status of female faculty members differs considerably by the type of higher education institution. Much of the overall increase can be attributed to the number of female faculty in 2-year colleges. In 2005-2006, women held over half (51%) of full-time faculty positions in 2-year colleges (Touchton, 2008). Consistently over time, 2-year colleges have outpaced their 4-year counterparts in the hiring of female faculty members (Opp & Gosetti, 2002).

The number of women earning doctorates has steadily increased, yet the proportion of women teaching at 2-year colleges remains much higher than that of those faculty at the research institutions where they earned their doctorates (Jacobson, 2004). Many researchers contend that more and more female PhD's are choosing to work at community colleges because they want to balance family and career (Jacobsen, 2004; West & Curtis, 2006; Wolf-Wendel, Ward, & Twombly, 2007). They have argued that female faculty members in 4-year institutions are disproportionately impacted by the traditional policies and practices of these institutions.

Due to this inequitable integration of women across all types of colleges and universities, the American Association of University Professors has created a new measure of women's progress in higher education. The four "gender equity indicators" represent different aspects of the overall status of female faculty including employment status (full or part-time), tenure track options, academic rank and salary (West & Curtis, 2006, p. 6). The most interesting aspects of the data, as applied to community colleges, are the facts that more women than men hold part-time positions, more women than men hold non-tenure track positions, more women than men hold the lower faculty ranks, and women earn approximately 90% of what male faculty members earn (AAUP, 2006).

Another factor to consider when reviewing the disproportionate number of women in the community college faculty ranks versus 4-year institutions, is the different credential requirements of community college faculty. Universities require the doctorate or professional degree for faculty. The master's degree is the most commonly required credential for community college faculty. In 2006, women earned professional degrees at equal rates of men for the first time in history (Touchton, 2008). Therefore, future studies may realize different results when comparing female and male faculty across institution types and teaching disciplines.

2 Purpose of the Study

The purpose of this study was to determine the extent to which female faculty members employed full-time or part-time at community colleges in the State of Texas had changed from 2000 through the 2008 academic year. Given the emphasis placed on faculty diversity, the number and percentage of female faculty members should have increased since 2000. This increase is even more important, given the increase in student diversity present at community colleges.

3 Research Questions

The following research questions were addressed in this study:

1. What are the numbers and percentages of female faculty members employed full-time at Texas community colleges from the 2000 through the 2008 academic year?
2. Is there a statistically significant difference in the percentage of female faculty members employed full-time at Texas community colleges from 2000 to 2008?
3. What are the numbers and percentages of female faculty members employed part-time at Texas community colleges from the 2000 through the 2008 academic year?
4. Is there a statistically significant difference in the percentage of female faculty members employed part-time at Texas community colleges from 2000 to 2008?

4 Method

4.1 Participants

Participants for this study were the 75 community colleges on whom data were available at the Texas Higher Education Coordinating Board Accountability system website (http://www.txhighereddata.org/Interactive/Accountability/). Using the Interactive Institutional List function on the Texas Higher Education Coordinating Board Accountability system website, the number of female faculty members employed full-time or part-time at Texas community colleges from 2000 through the 2008 academic year, as well as the total number of faculty members employed full-time and part-time at these institutions were downloaded into an Excel file (http://www.txhighereddata.org/Interactive/Accountability/Matrix_All.cfm?Type=CC). Then these data were converted into a database suitable for analysis by the Statistical Package for the Social Sciences-PC Version 15.0.

5 Results

5.1 Full-Time Faculty Members

The number of female faculty members employed full-time at Texas community colleges ranged from a low of 0 to a high of 331 in 2000, compared to a low of 0 and a high of 373 in 2008. The average number of full-time female faculty members employed at Texas community colleges in 2000 was 74.63 (SD = 69.51) whereas the average number of full-time female faculty members in 2008 was 95.99 (SD = 85.89). With the exception of the 2003 and 2006 academic years, the number of females employed full-time at Texas community colleges showed a steady increase.

Descriptive Statistics for Numbers of Female Full-Time Faculty Members by Year

Year	M	SD	Minimum Number	Maximum Number
2000	74.63	69.51	0	331
2001	77.81	73.53	0	346
2002	83.63	79.56	3	420
2003	81.56	76.27	3	350
2004	87.19	82.36	3	377
2005	88.52	78.80	3	393
2006	87.61	78.47	6	378
2007	93.57	86.24	4	377
2008	95.99	85.89	0	373

Table 1

Prior to conducting inferential statistics to determine whether a statistically significant increase had occurred in the number of female faculty members at Texas community colleges, checks were conducted to determine the extent to which these data were normally distributed. Of the standardized skewness coefficients (i.e., the skewness value divided by its standard error) and the standardized kurtosis coefficients (i.e., the kurtosis value divided by its standard error), all were beyond the limits of normality, +/- 3 (Onwuegbuzie & Daniel, 2002). According, a nonparametric dependent samples t-test was conducted. Checks of normality, conducted prior to performing the remaining inferential statistical procedures, revealed that all data were non-normally distributed. As such, nonparametric procedures were performed to answer our research questions.

To determine whether a statistically significant difference was present between the numbers of female full-time faculty members from the 2000 to the 2008 academic years, we conducted a Wilcoxon signed-rank test (Huck, 2007). This statistical procedure is similar to a parametric dependent samples t-test in that both measures examine mean differences between two groups. Instead of examining the average number of female full-time faculty members, however, the Wilcoxon signed-rank test addresses the difference between the mean ranks of the two groups. This analysis yielded a statistically significant result, z= -5.71, $p < .001$, Cohen's $d = 0.29$, and was reflective of a small effect size. Because the total number of full-time faculty members increased over this 9-year time period, percentages of the full-time faculty who were women were calculated for each of these 9 years.

Descriptive Statistics for Percentages of Female Full-Time Faculty Members by Year

Year	M	SD	Minimum%age	Maximum%age
2000	48.81	07.73	25.00	66.00
2001	48.99	08.07	23.00	67.00
2002	49.83	08.36	23.00	85.00
2003	49.23	07.79	23.00	63.00
2004	50.08	07.72	23.00	67.00
2005	50.32	07.49	23.00	63.00
2006	50.72	07.08	29.00	62.00
2007	51.76	07.09	33.00	64.00
2008	51.66	09.05	0.00	65.00

Table 2

In 2000, the average percentage of full-time faculty members at Texas community colleges who were female was 48.81% (SD = 7.73%) where in 2008; the average percentage of full-time faculty members who were female was 51.66% (SD = 9.05%). To determine whether a statistically significant increase was present in the percentage of full-time female faculty members at Texas community colleges, a Wilcoxon signed-rank test was conducted. The result was statistically significant, z= -4.41, $p < .001$, Cohen's $d = 0.49$. Using Cohen's criteria (1988), this finding was reflective of a moderate effect size. The percentage of full-time female faculty members employed full-time across this 9-year time period had increased 3.56%.

5.2 Part-Time Faculty Members

The number of female faculty members employed part-time at Texas community colleges ranged from a low of 0 to a high of 927 in 2000, compared to a low of 3 and a high of 1154 in 2008. The average number of female part-time faculty members employed at Texas community colleges in 2000 was 128.61 (SD = 148.36) whereas the average number of female faculty members employed part-time at Texas community colleges in 2008 was 172.93 (SD = 211.07). With the exception of the 2007 academic year, a steady growth was present in the number of female faculty members employed part-time at Texas community colleges. Similar to the data on full-time faculty members, the data on part-time faculty employment were also non-normal. According, nonparametric dependent samples t-tests were conducted.

To ascertain whether a statistically significant difference was present between the numbers of female part-time faculty members from the 2000 to the 2008 academic years, we conducted a Wilcoxon signed-rank test (Huck, 2007). This analysis yielded a statistically significant result, z= -5.70, $p < .001$, Cohen's d = 0.26, and was reflective of a small effect size.

Descriptive Statistics for Numbers of Female Part-Time Faculty Members by Year

Year	M	SD	Minimum Number	Maximum Number
2000	128.61	148.36	0	927
2001	136.11	153.01	0	948
2002	147.88	165.47	0	972
2003	153.48	179.15	0	1107
2004	157.89	193.46	0	1253
2005	163.32	213.17	1	1355
2006	171.19	214.34	2	1337
2007	166.05	204.48	4	1189
2008	172.93	211.07	3	1154

Table 3

We conducted an analysis regarding the number of Texas community college part-time faculty members in 2000 and in 2008 to determine whether a statistically significant increase had occurred in the total number of faculty members employed part-time at Texas community colleges. This analysis yielded a statistically significant result, z= -4.11, $p < .001$, Cohen's $d = 0.18$. As expected, the total number of part-time faculty members at Texas community colleges demonstrated a statistically significant increase over this 9-year time period.

Because of this finding, the percentage of female part-time faculty members was calculated for each of the 9 years analyzed in this study. In 2000, the average percentage of female faculty members employed part-time at Texas community colleges was 48.67% ($SD = 8.49\%$). In 2008, the average percentage of female faculty members employed part-time was 54.78% ($SD = 6.52$). The percentage of female part-time faculty members showed a steady increase from 2000 through the 2008 academic years.

Descriptive Statistics for Percentages of Female Part-Time Faculty Members by Year

Year	M	SD	Minimum%age	Maximum%age
2000	48.67	8.49	0.00	65.00
2001	49.91	6.79	3.10	66.00
2002	49.72	8.77	0.00	68.00
2003	50.56	8.65	0.00	65.00
2004	50.66	8.41	0.00	68.00
2005	52.53	6.52	4.00	73.00
2006	53.95	8.31	3.70	71.00
2007	54.53	8.46	4.10	73.00
2008	54.78	6.52	4.00	75.00

Table 4

To determine whether a statistically significant increase was present in the percentage of female part-time faculty members at Texas community colleges, a Wilcoxon signed-rank test was conducted and yielded a

statistically significant result, z= -6.21, $p < .001$, Cohen's $d = 0.80$. Thus, a large increase had occurred in the percentage of female part-time faculty members at Texas community colleges across this 9-year time period.

6 Discussion

Our purpose in conducting this study was to determine whether the percentage of full-time women faculty members in Texas community colleges had changed over a 9-year time period. The percentages of female faculty members showed an increase from 48.79% of full-time faculty members in 2000 to 51.66% of full-time faculty members in 2008. These percentages are higher than the national percentage of 47.3% of 2-year college faculty being female. In sum, women full-time faculty members have increased their presence in Texas community colleges over a 9-year time period.

A majority of the faculty employed in community colleges teach part-time. According to the National Center for Education Statistics, in fall 2003, over 66.7% of faculty employed in public community colleges were employed part-time. In Texas, part-time faculty constitute 62.1% of all faculty employed in public community colleges. The use of part-time faculty has steadily increased, as has the growth of female part-time faculty in Texas community colleges.

Reviewing the numbers and percentages of female faculty members in both Texas community colleges and community colleges across the United States would indicate no issue with diversity and equitable representation based on gender. In fact, some may note that women are overrepresented in the faculty ranks of community colleges. The increase of women full-time and part-time faculty in Texas community colleges does not necessarily indicate progress or parity with male faculty members. Some researchers contend the increased presence of women in academe has actually resulted in their losing ground. In the climate study of female community college faculty conducted by Hagedorn and Laden (2002), they reported that women remain concentrated in the disciplinary areas of the humanities, social sciences, health care and education. Professional recognition for accomplishments was sacrificed to the male-dominated fields in the hard sciences. However, the researchers acknowledged that their study indicated a more favorable status and a warmer climate for female faculty at community colleges than for female faculty at 4-year institutions. Others have studied factors to explain this finding. Townsend (1995) contended that women fare better in community colleges than 4-year institutions due to their larger numbers and the significant number of women in community college leadership roles.

Given that the majority of students enrolled in 2-year and in 4-year colleges are female, we believe that having faculty members who are reflective of the students they teach is positive. In this study, we addressed the issue of female faculty members for only one state. Accordingly, the extent to which our findings generalize to other states is unknown. Other researchers are encouraged to examine this issue, not only as it relates to faculty member's gender but to their ethnic membership as well. Until these findings are replicated, readers should avoid over generalizing these findings.

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