

Starting with FSSE 2013, sets of items were grouped within several scales. Forty-two survey items were included in these scales: Higher-Order Learning, Reflective and Integrative Learning, Learning Strategies, Quantitative Reasoning, Collaborative Learning, Discussions with Diverse Others, Student-Faculty Interaction, Quality of Interactions, and Supportive Environment. For details about the construct validity of these scales, see the [FSSE Psychometric Portfolio](#). A tenth scale, Effective Teaching Practices, was added to the FSSE scales in 2014. The purpose of this study was to evaluate the quality of the Effective Teaching Practices scale, with particular focus on their internal structure.

Data

Results for this study were drawn from the 2015 administration of the FSSE survey, with 19,056 faculty from 133 bachelor's-granting colleges and universities. Response rates at individual institutions ranged from 15% to 83%, while the average was 48%.

Methods

In preparation for the exploratory and confirmatory factor analyses, the FSSE 2015 dataset was randomly divided in half. Half of the sample was used in the exploratory factor analysis (EFA) and the other half was used in the confirmatory factor analysis (CFA).

First, a principle components exploratory factor analysis was used, which included all fifty items that appear in FSSE scales, in order to explore the factor structure that would emerge from the data. In order to allow for correlations between factors, a principal components analysis with an oblique, direct oblimin rotation was used. Factors with eigenvalues of 1 or greater were kept as potential components. All factor loadings of 0.4 or higher are reported.

In the second stage, a confirmatory factor analysis was done using the AMOS 23.0 statistical software program based on the results from the exploratory factor analysis. Separate confirmatory factor analyses were completed for all faculty members who teach lower-division courses and those who teach upper-division courses.

Results

The scales and component items under the Experiences with Faculty theme, Student-Faculty Interaction and Effective Teaching Practices, which were created are presented in Table 1. The EFA suggested that after putting all fifty scale items in the EFA analysis, twelve distinct components explained 65% of the variance. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy was .89 indicating "meritorious" factorability of the items (Kaiser, 1974). Bartlett's Test of Sphericity was significant ($p < .001$) indicating that the correlations among items are appropriate for a factor analysis (Meyers, Gamst, & Guarino, 2006). The section of the EFA structure matrix for the items under the Experiences with Faculty theme can be seen in Table 2. It suggests the following scales for further examination: Student-Faculty Interaction and Effective Teaching Practices.

Table 1. Experiences with Faculty Them, Scales and Component Items

Theme	Scale	Variable	Item
Experiences with Faculty	Student-Faculty Interaction	fSFcareer	Talked about their career plans
		fSFotherwork	Worked on activities other than coursework (committees, student groups, etc.)
		fSFdiscuss	Discussed course topics, ideas, or concepts outside of class
	Effective Teaching Practices	FSFperform	Discussed their academic performance
		fETgoals	Clearly explain course goals and requirements
		fETorganize	Teach course sessions in an organized way
		fETexample	Use examples or illustrations to explain difficult points
		fETvariety	Use a variety of teaching techniques to accommodate diversity in student learning styles
		fETreview	Review and summarize material for students
		fETstandards	Provide standards for satisfactory completion of assignments (rubrics, detailed outlines, etc.)
fETdraftfb	Provide feedback on drafts or works in progress		
fETfeedback	Provide prompt and detailed feedback on tests or completed assignments		

Table 2 Exploratory Factor Analysis Structure Matrix

	Component		
	1	2	3
fSFdiscuss		.819	
fSFcareer		.806	
fSFotherwork		.750	
fSFperform		.700	
fETgoals	.625		
fETorganize	.761		
fETexample	.704		
fETvariety	.468		
fETreview	.547		
fETstandards	.451		-.719
fETdraftfb	.234		-.609
fETfeedback	.523		

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

As shown in Table 3, both the second-order models fit very well for all faculty members who teach lower-division courses and those who teach upper-division courses (i.e., GFI > .95, CFI > .90, RMSEA < .06 and PCLOSE > .05).

Table 3. Summary of Fit Indices for Confirmatory Factor Analysis

	Upper Division					Lower Division				
	CMIN/df	GFI	CFI	RMSEA	PCLOSE	CMIN/df	GFI	CFI	RMSEA	PCLOSE
Experiences with Faculty	12.624	.98	.96	.05	.123	10.477	.98	.95	.05	.06

Finally, table 4 presents the standardized regression weights from the confirmatory factor analysis. The

standardized regression weights showed good strength of factor loadings for the scale for both lower-division faculty and upper-division faculty. Overall, the fit indices, factor correlations, and regression weights suggest good scales in the FSSE survey. See figures of the path models in the Appendix.

Table 4. Standardized Regression Weights

	Upper Division	Lower Division
Student-Faculty Interaction		
fSFcareer	0.698	0.709
fSFotherwork	0.665	0.670
fSFdiscuss	0.731	0.696
fSFperform	0.728	0.675
Effective Teaching Practices		
fETgoals	0.505	0.463
fETorganize	0.392	0.433
fETexample	0.476	0.474
fETvariety	0.627	0.603
fETreview	0.622	0.627
fETstandards	0.609	0.569
fETdraftfb	0.555	0.461
fETfeedback	0.524	0.500

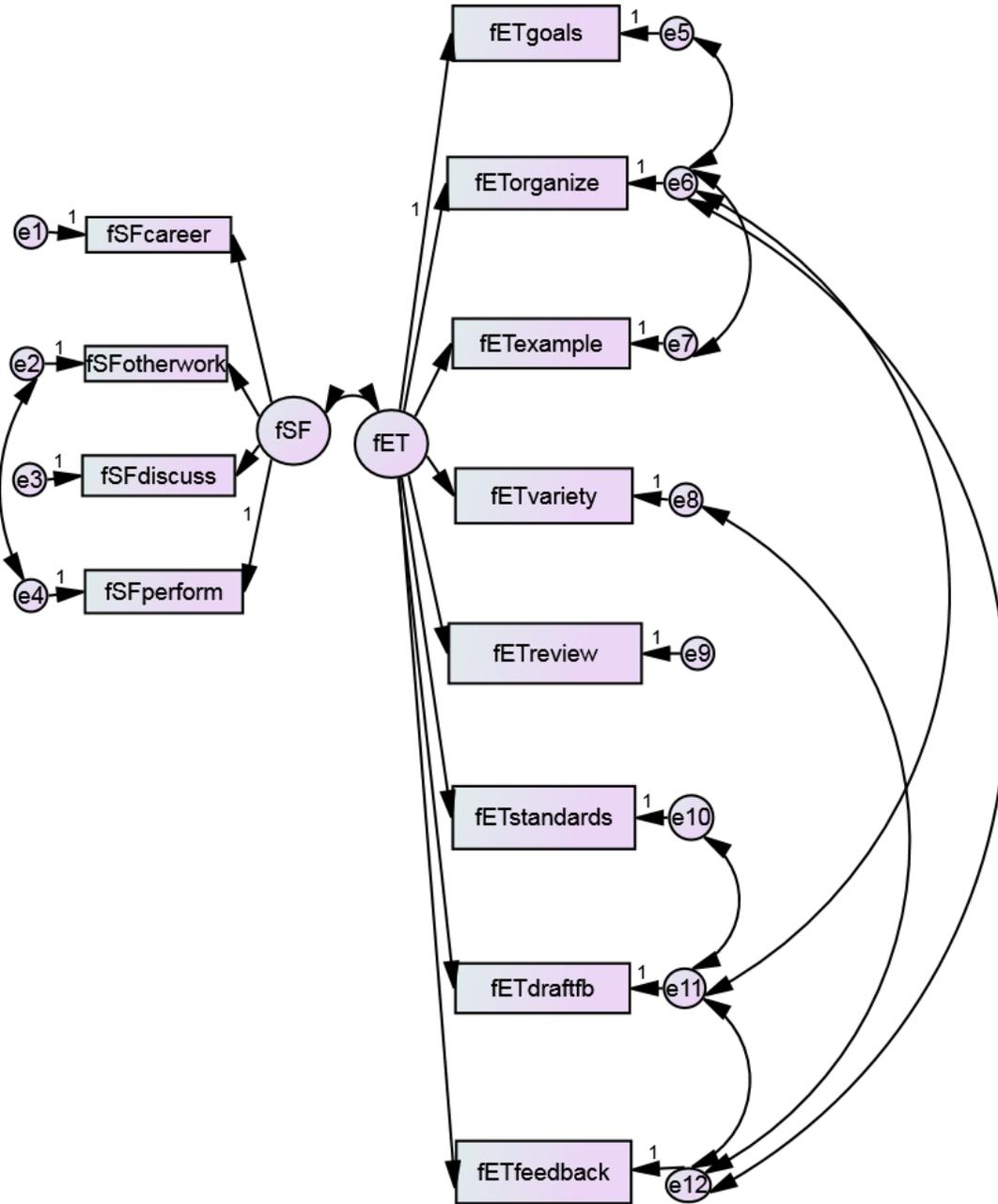
References

Kaiser, H. F. & Rice, J. (1974). Little Jiffy, Mark IV. *Educational and Psychological Measurement*, 34, 111-117.

Meyers, L. S., Gamst, G., & Guarino, A. J. (2006). *Applied Multivariate Research: Design and Interpretation*. Thousand Oaks, CA: Sage Publications.

Appendix

**Confirmatory Factor Analysis Models
Experience with Faculty-Lower-Division**



Experience with Faculty-Upper-Division

