

Starting with FSSE 2013, sets of items were grouped within several scales. Forty-two survey items are 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. A tenth scale, Effective Teaching Practices, was added to the FSSE scales in 2014. For details about the construct validity of this scale, see the [FSSE Psychometric Portfolio](#). The purpose of this study was to evaluate the quality of these scales, with particular focus on their internal structure.

## Data

Results for this study were drawn from the 2013 administration of the FSSE survey, with 18,133 faculty from 146 bachelor's-granting colleges and universities. Response rates at individual institutions ranged from 11% to 88%.

## Methods

In preparation for the exploratory and confirmatory factor analyses, the FSSE 2013 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, 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 22.0 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 FSSE scales and component items that were created are presented in Table 1. The EFA suggested fourteen distinct components which explained 62% of the variance. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy was .88 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).

Both the structure (Table 2) and pattern matrix (Table 3) suggest the following parallel scales for further examination: Higher-Order Learning, Reflective and Integrative Learning, Learning Strategies, Quantitative Reasoning, Collaborative Learning, Diverse Discussions with Others, Student-Faculty Interaction, and Quality of Interactions and Supportive Environment. Factor loadings can be found in Tables 2 and 3.

Table 1. FSSE scales and component items

| Theme                    | Scale                             | Variable                                                                                 | Item                                                                                                   |                                                                                                                        |
|--------------------------|-----------------------------------|------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| Academic Challenge       | Higher-Order Learning             | fHOapply                                                                                 | Applying facts, theories, or methods to practical problems or new situations                           |                                                                                                                        |
|                          |                                   | fHOanalyze                                                                               | Analyzing an idea, experience, or line of reasoning in depth by examining its parts                    |                                                                                                                        |
|                          |                                   | fHOevaluate                                                                              | Evaluating a point of view, decision, or information source                                            |                                                                                                                        |
|                          | Reflective & Integrative Learning | fHOform                                                                                  | fHOform                                                                                                | Forming a new idea or understanding from various pieces of information                                                 |
|                          |                                   |                                                                                          | fRIintegrate                                                                                           | Combine ideas from different courses when completing assignments                                                       |
|                          |                                   |                                                                                          | fRIsocietal                                                                                            | Connect his or her learning to societal problems or issues                                                             |
|                          |                                   | fRIDiverse                                                                               | fRIDiverse                                                                                             | Include diverse perspectives (political, religious, racial/ethnic, gender, etc.) in course discussions or assignments  |
|                          |                                   |                                                                                          | fRIownview                                                                                             | Examine the strengths and weaknesses of his or her own views on a topic or issue                                       |
|                          |                                   |                                                                                          | fRIperspect                                                                                            | Try to better understand someone else's views by imagining how an issue looks from his or her perspective              |
|                          |                                   |                                                                                          | fRInewview                                                                                             | Learn something that changes the way he or she understands an issue or concept                                         |
|                          | Learning Strategies               | fRIconnect                                                                               | fRIconnect                                                                                             | Connect ideas from your course to his or her prior experiences and knowledge                                           |
|                          |                                   |                                                                                          | fLSreading                                                                                             | Identify key information from reading assignments                                                                      |
|                          |                                   |                                                                                          | fLSnotes                                                                                               | Review notes after class                                                                                               |
|                          |                                   | fLSummary                                                                                | fLSummary                                                                                              | Summarize what has been learned from class or from course materials                                                    |
|                          |                                   |                                                                                          | fQRconclude                                                                                            | Reach conclusions based on his or her own analysis of numerical information (numbers, graphs, statistics, etc.)        |
| Learning with Peers      | Quantitative Reasoning            | fQRproblem                                                                               | fQRproblem                                                                                             | Use numerical information to examine a real-world problem or issue (unemployment, climate change, public health, etc.) |
|                          |                                   |                                                                                          | fQRevaluate                                                                                            | Evaluate what others have concluded from numerical information                                                         |
|                          |                                   | Collaborative Learning                                                                   | fCLaskhelp                                                                                             | Ask other students for help understanding course material                                                              |
|                          |                                   |                                                                                          | fCLexplain                                                                                             | Explain course material to other students                                                                              |
|                          |                                   |                                                                                          | fCLstudy                                                                                               | Prepare for exams by discussing or working through course material with other students                                 |
|                          | Discussions with Diverse Others   | fCLproject                                                                               | Work with other students on course projects or assignments                                             |                                                                                                                        |
|                          |                                   | fDRace                                                                                   | People of a race or ethnicity other than their own                                                     |                                                                                                                        |
|                          |                                   | fDDeconomic                                                                              | People from an economic background other than their own                                                |                                                                                                                        |
|                          |                                   | fDReligion                                                                               | People with religious beliefs other than their own                                                     |                                                                                                                        |
|                          |                                   | fDDpolitical                                                                             | People with political views other than their own                                                       |                                                                                                                        |
| 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                                           |                                                                                                                        |
|                          |                                   | fSFperform                                                                               | Discussed their academic performance                                                                   |                                                                                                                        |
| Campus Environment       | Quality of Interactions           | fQIstudent                                                                               | Other students                                                                                         |                                                                                                                        |
|                          |                                   | fQIadvisor                                                                               | Academic advisors                                                                                      |                                                                                                                        |
|                          |                                   | fQIfaculty                                                                               | Faculty                                                                                                |                                                                                                                        |
|                          |                                   | fQIstaff                                                                                 | Student services staff (career services, student activities, housing, etc.)                            |                                                                                                                        |
|                          |                                   | fQIadmin                                                                                 | Other administrative staff and offices (registrar, financial aid, etc.)                                |                                                                                                                        |
|                          |                                   | Supportive Environment                                                                   | fSEacademic                                                                                            | Providing support to help students succeed academically                                                                |
|                          |                                   |                                                                                          | fSElearnsup                                                                                            | Students using learning support services (tutoring services, writing center, etc.)                                     |
|                          | fSEdiverse                        |                                                                                          | Encouraging contact among students from different backgrounds (social, racial/ethnic, religious, etc.) |                                                                                                                        |
|                          | fSEsocial                         |                                                                                          | Providing opportunities for students to be involved socially                                           |                                                                                                                        |
|                          | fSEwellness                       | fSEwellness                                                                              | Providing support for students' overall well-being (recreation, health care, counseling, etc.)         |                                                                                                                        |
|                          |                                   | fSEnonacad                                                                               | Helping students manage their non-academic responsibilities (work, family, etc.)                       |                                                                                                                        |
| fSEactivities            |                                   | Students attending campus activities and events (performing arts, athletic events, etc.) |                                                                                                        |                                                                                                                        |
| fSEevents                |                                   | Students attending events that address important social, economic, or political issues   |                                                                                                        |                                                                                                                        |

Table 2. Exploratory Factor Analysis Structure Matrix

|               | Component |      |       |      |       |       |      |      |      |       |      |      |    |       |
|---------------|-----------|------|-------|------|-------|-------|------|------|------|-------|------|------|----|-------|
|               | 1         | 2    | 3     | 4    | 5     | 6     | 7    | 8    | 9    | 10    | 11   | 12   | 13 | 14    |
| fRlperspect   | .818      |      |       |      |       |       |      |      |      |       |      |      |    |       |
| fRlownview    | .797      |      |       |      |       |       |      |      |      |       |      |      |    |       |
| fRldiverse    | .779      |      |       |      |       |       |      |      |      |       |      |      |    |       |
| fRIsocietal   | .756      |      |       |      |       |       |      |      |      |       |      |      |    |       |
| fRlnewview    | .717      |      |       |      |       |       |      |      |      |       |      |      |    |       |
| fRlconnect    | .706      |      |       |      |       |       |      |      |      |       |      |      |    |       |
| fRlintegrate  | .545      |      |       |      |       |       |      |      |      |       |      |      |    |       |
| faskquest     | .457      |      |       |      |       |       |      |      |      |       |      |      |    |       |
| fCLexplain    |           | .866 |       |      |       |       |      |      |      |       |      |      |    |       |
| fCLaskhelp    |           | .866 |       |      |       |       |      |      |      |       |      |      |    |       |
| fCLstudy      |           | .771 |       |      |       |       |      |      |      |       |      |      |    |       |
| fCLproject    |           | .719 |       |      |       |       |      |      |      |       |      |      |    |       |
| fSEsocial     |           |      | -.795 |      |       |       |      |      |      |       |      |      |    |       |
| fSEwellness   |           |      | -.777 |      |       |       |      |      |      |       |      |      |    |       |
| fSEactivities |           |      | -.776 |      |       |       |      |      |      |       |      |      |    |       |
| fSEevents     |           |      | -.729 |      |       |       |      |      |      |       |      |      |    |       |
| fSEdiverse    |           |      | -.673 |      |       |       |      |      |      |       |      |      |    |       |
| fSEnonacad    |           |      | -.665 |      |       |       |      |      |      |       |      |      |    |       |
| fQladvisor    |           |      |       | .832 |       |       |      |      |      |       |      |      |    |       |
| fQlstaff      |           |      |       | .830 |       |       |      |      |      |       |      |      |    |       |
| fQlfaculty    |           |      |       | .805 |       |       |      |      |      |       |      |      |    |       |
| fQladmin      |           |      |       | .802 |       |       |      |      |      |       |      |      |    |       |
| fQlstudent    |           |      |       | .669 |       |       |      |      |      |       |      |      |    |       |
| fchallenge    |           |      |       | .451 |       |       |      |      |      |       |      |      |    |       |
| fDDeconomic   |           |      |       |      | -.912 |       |      |      |      |       |      |      |    |       |
| fDDpolitical  |           |      |       |      | -.907 |       |      |      |      |       |      |      |    |       |
| fDDreligion   |           |      |       |      | -.893 |       |      |      |      |       |      |      |    |       |
| fDDrace       |           |      |       |      | -.883 |       |      |      |      |       |      |      |    |       |
| fQRproblem    |           |      |       |      |       | -.921 |      |      |      |       |      |      |    |       |
| fQRevaluate   |           |      |       |      |       | -.884 |      |      |      |       |      |      |    |       |
| fQRconclude   |           |      |       |      |       | -.868 |      |      |      |       |      |      |    |       |
| fetorganize   |           |      |       |      |       |       | .785 |      |      |       |      |      |    |       |
| fetgoals      |           |      |       |      |       |       | .698 |      |      |       |      |      |    |       |
| fetexample    |           |      |       |      |       |       | .668 |      |      |       |      |      |    |       |
| fetfeedback   |           |      |       |      |       |       | .646 |      |      |       |      |      |    |       |
| fSFdiscuss    |           |      |       |      |       |       |      | .812 |      |       |      |      |    |       |
| fSFcareer     |           |      |       |      |       |       |      | .806 |      |       |      |      |    |       |
| fSFotherwork  |           |      |       |      |       |       |      | .750 |      |       |      |      |    |       |
| fSFperform    |           |      |       |      |       |       |      | .665 |      |       |      |      |    |       |
| fwrmed        |           |      |       |      |       |       |      |      | .832 |       |      |      |    |       |
| fwrlong       |           |      |       |      |       |       |      |      | .828 |       |      |      |    |       |
| fHOanalyze    |           |      |       |      |       |       |      |      |      | -.809 |      |      |    |       |
| fHOform       |           |      |       |      |       |       |      |      |      | -.767 |      |      |    |       |
| fHOevaluate   | .438      |      |       |      |       |       |      |      |      | -.729 |      |      |    |       |
| fHOapply      |           |      |       |      |       |       |      |      |      | -.604 |      |      |    |       |
| fLSnotes      |           |      |       |      |       |       |      |      |      |       | .806 |      |    |       |
| fLSsummary    |           |      |       |      |       |       |      |      |      |       | .741 |      |    |       |
| fLSreading    |           |      |       |      |       |       |      |      |      |       | .660 |      |    |       |
| fmemorize     |           |      |       |      |       |       |      |      |      |       |      |      |    |       |
| fSEacademic   |           |      | -.474 |      |       |       |      |      |      |       |      | .744 |    |       |
| fSElearnsup   |           |      | -.476 |      |       |       |      |      |      |       |      | .704 |    |       |
| fempstudy     |           |      |       |      |       |       |      |      |      |       |      | .702 |    |       |
| fprepared     |           |      |       |      |       |       |      |      |      |       |      | .439 |    |       |
| fdrafts       |           |      |       |      |       |       |      |      |      |       |      |      |    | -.694 |
| fetdraftfb    |           |      |       |      |       |       | .421 |      |      |       |      |      |    | -.654 |
| fwrwriting    |           |      |       |      |       |       |      |      |      |       |      |      |    | .636  |
| fwrshort      |           |      |       |      |       |       |      |      |      |       |      |      |    | .574  |

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

Table 3. Exploratory Factor Analysis Pattern Matrix

|               | Component |      |       |      |       |       |      |      |      |       |      |      |    |       |
|---------------|-----------|------|-------|------|-------|-------|------|------|------|-------|------|------|----|-------|
|               | 1         | 2    | 3     | 4    | 5     | 6     | 7    | 8    | 9    | 10    | 11   | 12   | 13 | 14    |
| fRlperspect   | .755      |      |       |      |       |       |      |      |      |       |      |      |    |       |
| fRlownview    | .726      |      |       |      |       |       |      |      |      |       |      |      |    |       |
| fRIsocietal   | .717      |      |       |      |       |       |      |      |      |       |      |      |    |       |
| fRIdiverse    | .711      |      |       |      |       |       |      |      |      |       |      |      |    |       |
| fRIconnect    | .701      |      |       |      |       |       |      |      |      |       |      |      |    |       |
| fRInewview    | .687      |      |       |      |       |       |      |      |      |       |      |      |    |       |
| fRIintegrate  | .485      |      |       |      |       |       |      |      |      |       |      |      |    |       |
| faskquest     |           |      |       |      |       |       |      |      |      |       |      |      |    |       |
| fCLaskhelp    |           | .880 |       |      |       |       |      |      |      |       |      |      |    |       |
| fCLexplain    |           | .862 |       |      |       |       |      |      |      |       |      |      |    |       |
| fCLstudy      |           | .717 |       |      |       |       |      |      |      |       |      |      |    |       |
| fCLproject    |           | .687 |       |      |       |       |      |      |      |       |      |      |    |       |
| fSEsocial     |           |      | -.794 |      |       |       |      |      |      |       |      |      |    |       |
| fSEactivities |           |      | -.771 |      |       |       |      |      |      |       |      |      |    |       |
| fSEwellness   |           |      | -.746 |      |       |       |      |      |      |       |      |      |    |       |
| fSEevents     |           |      | -.695 |      |       |       |      |      |      |       |      |      |    |       |
| fSEnonacad    |           |      | -.632 |      |       |       |      |      |      |       |      |      |    |       |
| fSEdiverse    |           |      | -.597 |      |       |       |      |      |      |       |      |      |    |       |
| fQIstaff      |           |      |       | .847 |       |       |      |      |      |       |      |      |    |       |
| fQIadvisor    |           |      |       | .833 |       |       |      |      |      |       |      |      |    |       |
| fQIadmin      |           |      |       | .819 |       |       |      |      |      |       |      |      |    |       |
| fQIfaculty    |           |      |       | .800 |       |       |      |      |      |       |      |      |    |       |
| fQIstudent    |           |      |       | .663 |       |       |      |      |      |       |      |      |    |       |
| fchallenge    |           |      |       |      |       |       |      |      |      |       |      |      |    |       |
| fDDeconomic   |           |      |       |      | -.917 |       |      |      |      |       |      |      |    |       |
| fDDpolitical  |           |      |       |      | -.904 |       |      |      |      |       |      |      |    |       |
| fDDreligion   |           |      |       |      | -.895 |       |      |      |      |       |      |      |    |       |
| fDDrace       |           |      |       |      | -.894 |       |      |      |      |       |      |      |    |       |
| fQRproblem    |           |      |       |      |       | -.917 |      |      |      |       |      |      |    |       |
| fQRevaluate   |           |      |       |      |       | -.874 |      |      |      |       |      |      |    |       |
| fQRconclude   |           |      |       |      |       | -.865 |      |      |      |       |      |      |    |       |
| fetorganize   |           |      |       |      |       |       | .808 |      |      |       |      |      |    |       |
| fetgoals      |           |      |       |      |       |       | .669 |      |      |       |      |      |    |       |
| fetexample    |           |      |       |      |       |       | .657 |      |      |       |      |      |    |       |
| fetfeedback   |           |      |       |      |       |       | .614 |      |      |       |      |      |    |       |
| fSFdiscuss    |           |      |       |      |       |       |      | .800 |      |       |      |      |    |       |
| fSFcareer     |           |      |       |      |       |       |      | .796 |      |       |      |      |    |       |
| fSFotherwork  |           |      |       |      |       |       |      | .747 |      |       |      |      |    |       |
| fSFperform    |           |      |       |      |       |       |      | .643 |      |       |      |      |    |       |
| fwrmed        |           |      |       |      |       |       |      |      | .840 |       |      |      |    |       |
| fwrlong       |           |      |       |      |       |       |      |      | .835 |       |      |      |    |       |
| fHOanalyze    |           |      |       |      |       |       |      |      |      | -.772 |      |      |    |       |
| fHOform       |           |      |       |      |       |       |      |      |      | -.696 |      |      |    |       |
| fHOevaluate   |           |      |       |      |       |       |      |      |      | -.644 |      |      |    |       |
| fHOapply      |           |      |       |      |       |       |      |      |      | -.588 |      |      |    |       |
| fLSnotes      |           |      |       |      |       |       |      |      |      |       | .762 |      |    |       |
| fLSsummary    |           |      |       |      |       |       |      |      |      |       | .690 |      |    |       |
| fLSreading    |           |      |       |      |       |       |      |      |      |       | .620 |      |    |       |
| fmemorize     |           |      |       |      |       |       |      |      |      |       |      |      |    |       |
| fSEacademic   |           |      |       |      |       |       |      |      |      |       |      | .688 |    |       |
| fempstudy     |           |      |       |      |       |       |      |      |      |       |      | .681 |    |       |
| fSElearnsup   |           |      |       |      |       |       |      |      |      |       |      | .636 |    |       |
| fprepared     |           |      |       |      |       |       |      |      |      |       |      |      |    |       |
| fdrafts       |           |      |       |      |       |       |      |      |      |       |      |      |    | -.661 |
| fetdraftfb    |           |      |       |      |       |       |      |      |      |       |      |      |    | -.622 |
| fwrwriting    |           |      |       |      |       |       |      |      |      |       |      |      |    | .647  |
| fwrshort      |           |      |       |      |       |       |      |      |      |       |      |      |    | .570  |

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

As shown in Table 4, 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 4. Summary of Fit Indices for Confirmatory Factor Analysis

|                          | Upper Division |      |      |       |        | Lower Division |      |      |       |        |
|--------------------------|----------------|------|------|-------|--------|----------------|------|------|-------|--------|
|                          | CMIN/<br>df    | GFI  | CFI  | RMSEA | PCLOSE | CMIN/<br>df    | GFI  | CFI  | RMSEA | PCLOSE |
| Academic Challenge       | 10.01          | .97  | .97  | .05   | .05    | 9.08           | .98  | .98  | .05   | .19    |
| Learning With Peers      | 1.58           | .99  | 1.00 | .01   | 1.00   | 1.28           | 1.00 | 1.00 | .01   | 1.00   |
| Experiences with Faculty | .216           | 1.00 | 1.00 | .00   | .99    | .216           | 1.00 | 1.00 | .00   | .99    |
| Campus Environment       | 3.240          | .99  | .99  | .03   | 1.00   | 5.023          | .99  | .99  | .04   | 1.00   |

Finally, table 5 presents the standardized regression weights from the confirmatory factor analysis. The standardized regression weights showed good strength of factor loadings for all scales for both lower-division faculty and upper-division faculty except for the item (fHOapply) *“Applying facts, theories, or methods to practical problems or new situations”* in the High-order Learning scale. Overall, the fit indices, factor correlations, and regression weights suggest good subscales in the FSSE survey. See figures of the path models in the Appendix.

Table 5 Standardized Regression Weights

|                          |                                   |              | Upper Division | Lower Division |
|--------------------------|-----------------------------------|--------------|----------------|----------------|
| Academic Challenge       | Higher-Order Learning             | fHOapply     | 0.262          | 0.169          |
|                          |                                   | fHOanalyze   | 0.672          | 0.560          |
|                          |                                   | fHOevaluate  | 0.839          | 0.920          |
|                          |                                   | fHOform      | 0.707          | 0.658          |
|                          | Reflective & Integrative Learning | fRIintegrate | 0.455          | 0.547          |
|                          |                                   | fRIsocietal  | 0.693          | 0.742          |
|                          |                                   | fRIdiverse   | 0.800          | 0.752          |
|                          |                                   | fRIlowview   | 0.799          | 0.883          |
|                          |                                   | fRIperspect  | 0.912          | 0.882          |
|                          |                                   | fRInewview   | 0.611          | 0.617          |
|                          |                                   | fRIconnect   | 0.530          | 0.555          |
|                          | Quantitative Reasoning            | fQRconclude  | 0.793          | 0.807          |
|                          |                                   | fQRproblem   | 0.909          | 0.930          |
|                          |                                   | fQRevaluate  | 0.854          | 0.824          |
|                          | Learning Strategies               | fLSreading   | 0.618          | 0.637          |
|                          |                                   | fLSnotes     | 0.706          | 0.699          |
|                          |                                   | fLSsummary   | 0.855          | 0.865          |
| Learning with Peers      | Collaborative Learning            | fCLaskhelp   | 0.842          | 0.864          |
|                          |                                   | fCLexplain   | 0.909          | 0.870          |
|                          |                                   | fCLstudy     | 0.659          | 0.704          |
|                          |                                   | fCLproject   | 0.496          | 0.587          |
|                          | Discussions with Diverse Others   | fDDrace      | 0.928          | 0.937          |
|                          |                                   | fDDeconomic  | 0.906          | 0.911          |
|                          |                                   | fDDreligion  | 0.827          | 0.831          |
| Experiences with Faculty | Student-Faculty Interaction       | fDFpolitical | 0.754          | 0.776          |
|                          |                                   | fSFcareer    | 0.724          | 0.724          |
|                          |                                   | fSFotherwork | 0.637          | 0.637          |
|                          |                                   | fSFdiscuss   | 0.702          | 0.702          |
| Campus Environment       | Quality of Interactions           | fSFperform   | 0.632          | 0.632          |
|                          |                                   | fQIstudent   | 0.589          | 0.573          |
|                          |                                   | fQIadvisor   | 0.818          | 0.825          |
|                          |                                   | fQIfaculty   | 0.794          | 0.766          |
|                          |                                   | fQIstaff     | 0.711          | 0.742          |
|                          | Supportive Environment            | fQIadmin     | 0.675          | 0.703          |
|                          |                                   | fSEacademic  | 0.476          | 0.472          |
|                          |                                   | fSElearnsup  | 0.491          | 0.476          |
|                          |                                   | fSEdiverse   | 0.607          | 0.643          |
|                          |                                   | fSEsocial    | 0.792          | 0.803          |
|                          |                                   | fSEwellness  | 0.792          | 0.779          |
| fSEnonacad               | 0.709                             | 0.711        |                |                |
| fSEactivities            | 0.637                             | 0.659        |                |                |
| fSEevents                | 0.569                             | 0.602        |                |                |

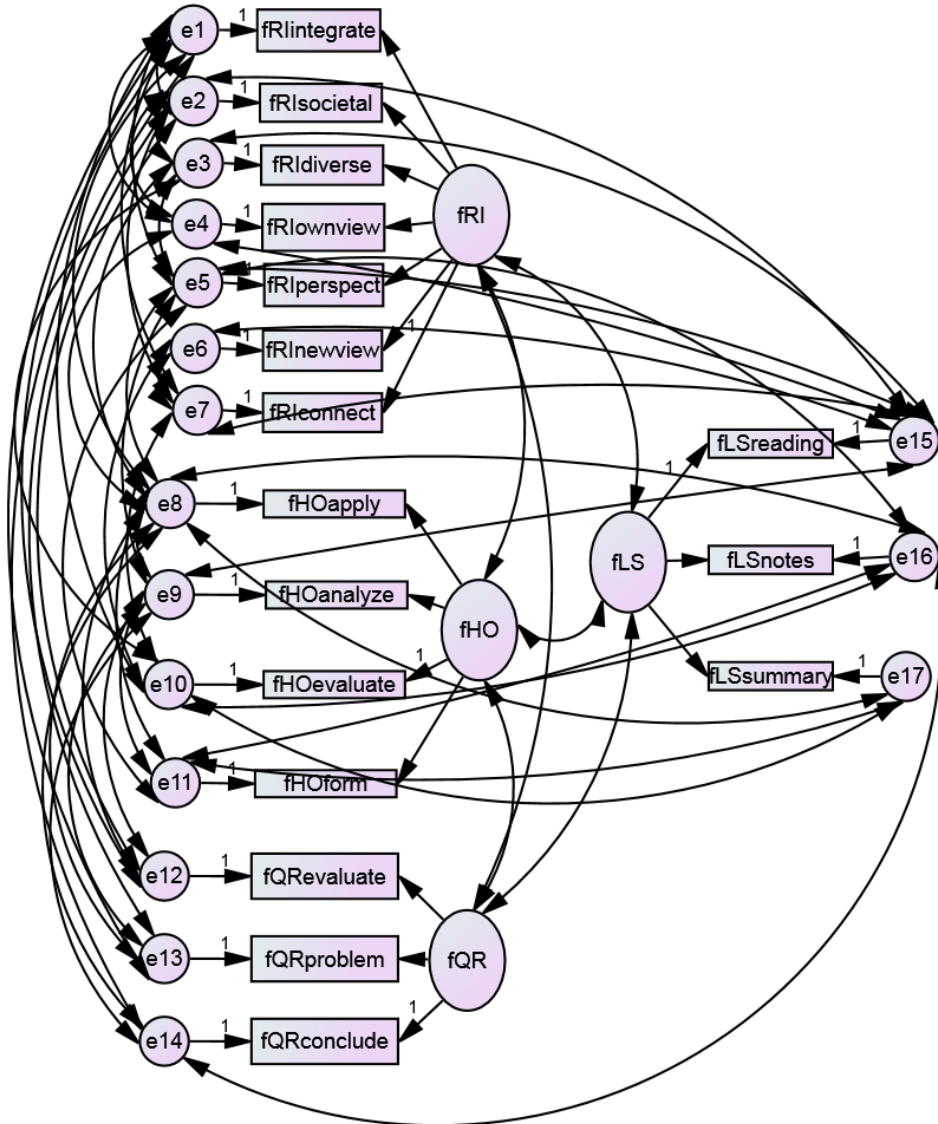
## References

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

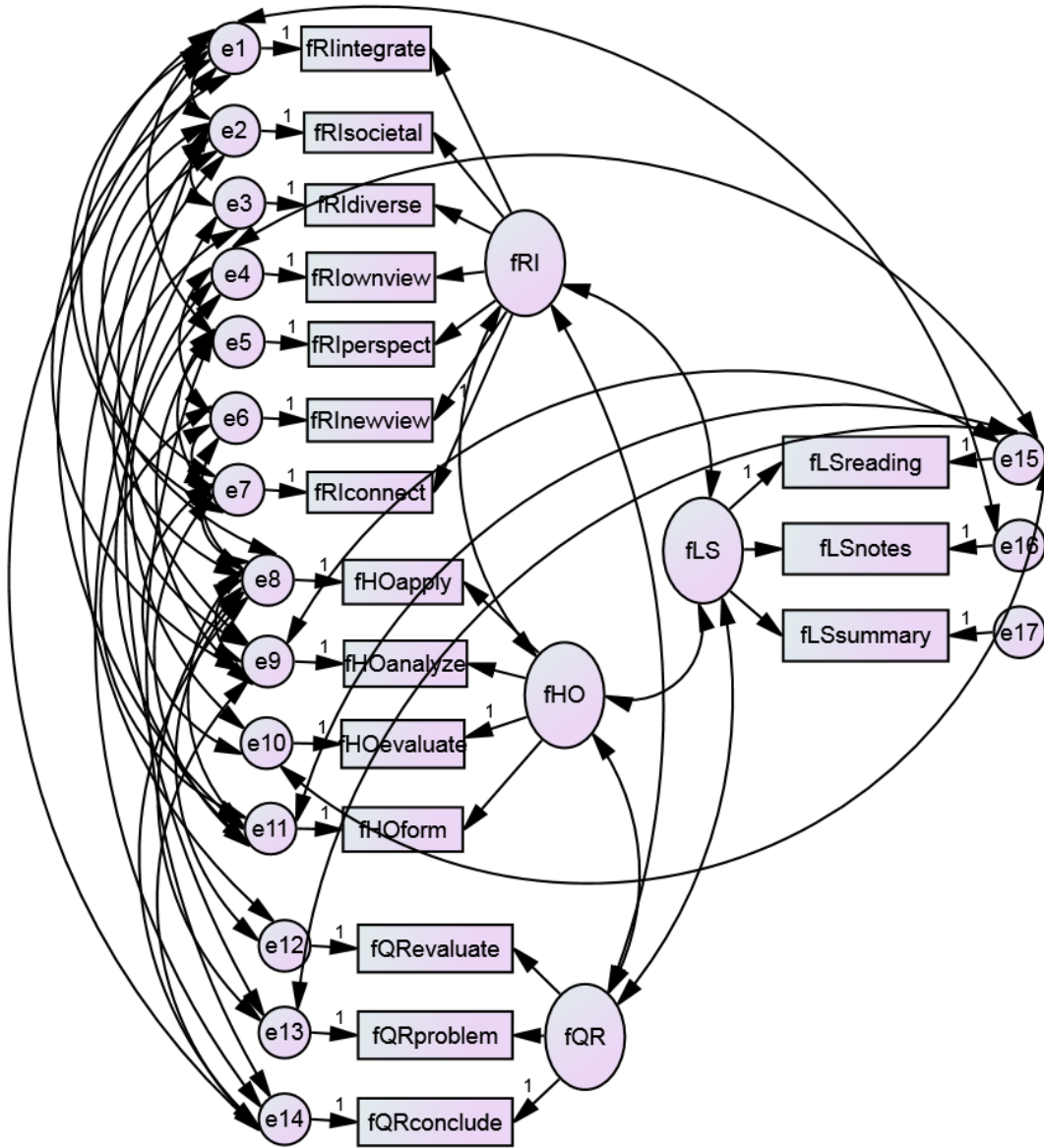
Meyers, L. S., Gamst, G., & Guarino, A. J. (2006). *Applied Multivariate Research: Design and Interpretation*. Thousand Oaks, CA: Sage Publications.

**Appendix**

**Confirmatory Factor Analysis Models  
Higher-Order Learning-Lower-Division**

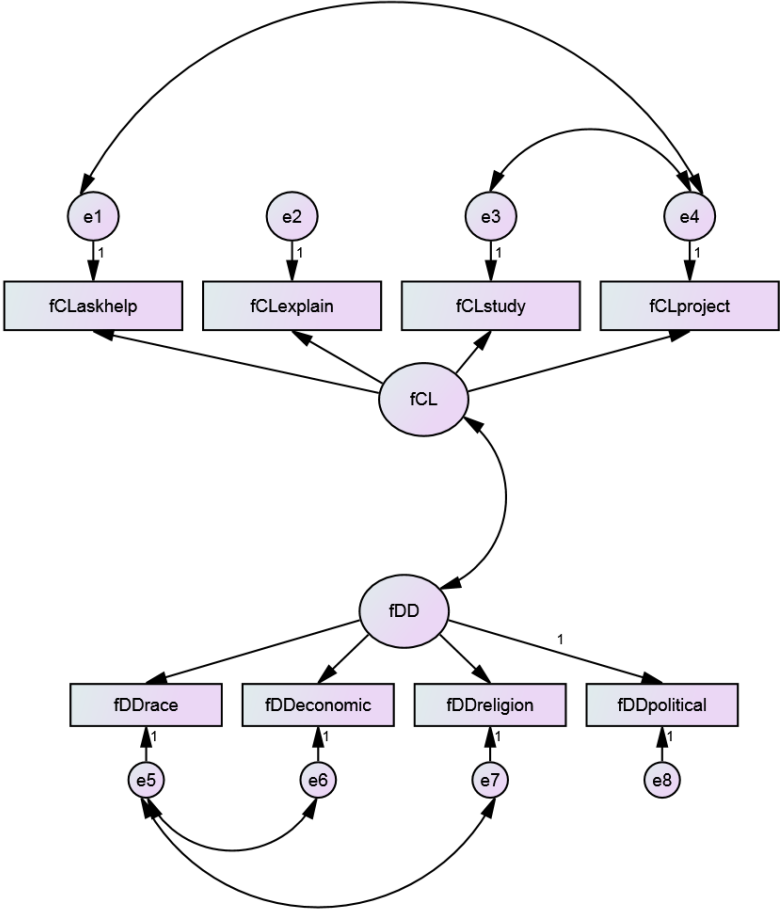


# Higher-Order Learning-Upper-Division

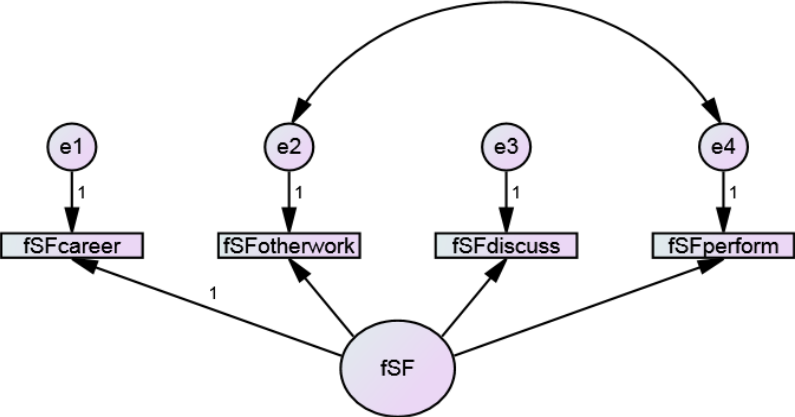




**Learning with Peers (Lower and upper division)**



**Experiences with Faculty (Lower and upper division)**



Campus Environment (Lower and upper division)

