Challenges & Benefits of Cross-Sectional Assessment

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1

Overview of Session

- Introduction of presenters and session
- Brief discussion on assumptions
- Audience examples
- Examples of analyses, reports, and research
- Facilitated discussion on implications
- Q&A

2

Learning Objectives

- Describe the different uses of longitudinal and cross-sectional data
- Apply strategies for analyzing cross-sectional data to one's own institutional datasets
- Evaluate the methods and practices one currently uses for cross-sectional data analyses
- Determine whether nested data is of concern in a cross-sectional situation

3

Longitudinal v. Cross-Sectional Data

- What do we know about longitudinal and cross-sectional data?
- How are they used in decision-making?

4

Longitudinal v. Cross-Sectional Data

- Same student over time
- Continuously monitor progress
- Time consuming and costly
- Causal inferences
- Time series

- Single set of data
- Parts of students' experiences
- Quicker
- Regressions & Comparisons
- Statistics over time

5

Longitudinal

1. What have you all done with longitudinal?
2. What were some of the challenges associated with the project?
3. How did the analysis inform decision making?

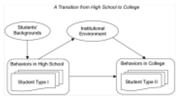
6

Longitudinal Example

- NSSE normally doesn't do or recommend doing longitudinal analyses
  - Engagement should look different in the first and final year
  - Persistence in major

[Cole, J. (2017). The biology pipeline: Understanding the persisters, leavers, and joiners. Program presented at the annual IACBT.]

- BCSSE-NSSE longitudinal studies are more common



Mu, L. & Cole, J. (2019). Behavior-based student typology: A view from student transition from high school to college. *Research in Higher Education*. https://doi.org/10.1007/s11162-019-09547-x

7

Cross-Sectional

1. How have you all used cross-sectional data?
2. What was the phenomena you were exploring? Did it lead to change at your institution?
3. What would you have done differently in your analysis or data collection method?

8

Cross-Sectional Examples

National Survey of Student Engagement (NSSE)

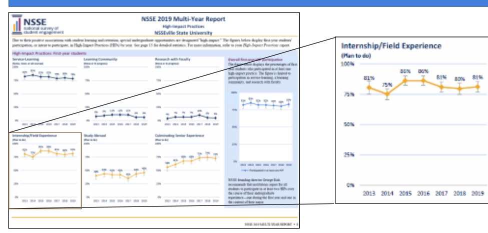
- First year students – Multi-Year Report
- Senior students' competencies - Nested Data

Faculty Survey of Student Engagement (FSSE)

- Teaching practices over time – Descriptive
- Scholarship of Teaching & Learning – Content Summary

9

Example: First Year Students



10

Example: Senior Students

Nested Data

- Multilevel Modeling (MLM)/Hierarchical Linear Modeling (HLM)
- Students within institutions
- Discover how much of the variation is at a particular level
  - This helps control for confounding variables or adjust our approach e.g., should the analysis be completed at level 1 or level 2

Seniors' competence in leadership, networking, creativity, and critical thinking as it relates to ability to have discussions with diverse others

11

Example: Senior Students

- Intraclass correlation (ICC)
- 2nd Level ~ 3% of the variance
- 1st Level ~97% of the variance

	Empty Model		Final Model	
	Coef(S.E)	t value	Coef(S.E)	t value
Fixed				
Intercept	.03(.02)	1.96	.03(.02)	2.20*
Critical			.09(.01)	11.80***
Networking			.10(.01)	14.02***
Leadership			.07(.01)	9.73***
Creative			.07(.01)	8.92***
Random				
Level 2 Var $\tau_0^2 = var(U_{0j})$	.03(.17)		.03(.17)	
Level 1 Var $\sigma^2 = var(R_{ij})$	.96(.97)		.88(.94)	
Deviance	86674.5		81241.7	
AIC	86680.5		81255.7	
BIC	86705.5		81313.8	
R^2			.081	

Dependent variable: Discussions with diverse others. *p<.05, **p<.01, ***p<.001

12

Example: Teaching Over Time

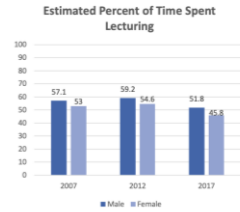
Descriptive statistics

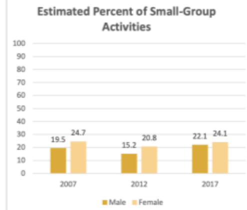
- Looking at trends
- Notice patterns that may need to be further explored
- Drill into specific demographics quickly
- Easy to comprehend and share with others

Understanding STEM faculty teaching practices over time

13

Example: Teaching Over Time





(Fassett & BrckaLorenz, 2018) https://scholarworks.iu.edu/dspace/handle/2022/23585

14

Example: Scholarship of T&L

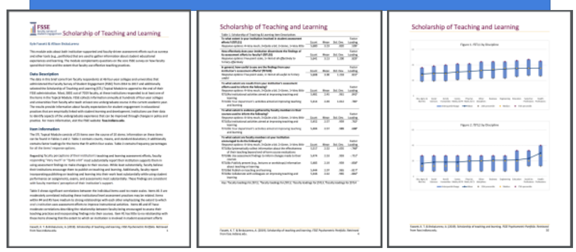
Content Summary

- Thoroughly examine items from a bunch of perspectives: frequencies, means, factor loadings, etc.
- Look at psychometric properties to assist with future renditions
- Discover differences between academic disciplines

Faculty participation in and feeling supported with scholarship of teaching and learning

15

Example: Scholarship of T&L



http://fsse.indiana.edu/pdf/FSTL_Content_Summary.pdf

16

Implications

- Longitudinal data
  - Do you want to follow a group of individuals over time?
  - Be careful when choosing your outcome
  - Make sure you are able to directly match people over time
- Cross-sectional data
  - Do you want to follow an experience over time?
  - Make sure to note differences in people across cohorts
  - Especially helpful for pre-/post- interventions

17

Q & A

Find our slides and other information about NSSE

nsse.indiana.edu

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18

References & Resources

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19