

# Workshop

## Building a Strong Foundation: Selecting the Right Statistical Analysis and Methods

### IFLA Statistics and Evaluation -Satellite Meeting 2023-

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University of Illinois Chicago Library

# ABOUT PRESENTER



## **Education**

- PhD in Educational Psychology
- MEd in Measurement, Evaluation, Statistics, and Assessment

## **Current Position/Responsibilities**

- Planning, designing and implementing library assessment initiatives,
- Leading regular internal and external surveys (e.g., student and faculty surveys)
- Conducting staff training and creates development opportunities for library staff related to assessment
- Providing consultations: Customer satisfaction/ User experience/ Usability testing/Quality Improvement projects; Research projects/ Classroom/workshop/training / Program evaluations

## **Research Project**

- Project Director, Developing Assessment Tools, (\$250,000), IMLS 2022-2024

## **Service**

- Research Scholar, ARL DEI Institute Task Force 2021-2023
- Chair, ACRL Value of Academic Libraries Committee 2022-2023
- Column Editor, Strategic Planning and Assessment, Journal of Library Administration, 2022-Present

# LEARNING OUTCOMES



Participants will gain practical skills in selecting appropriate methods and analysis techniques for different assessment projects.



Through the workshop, participants will gain a comprehensive understanding of the benefits and limitations of a specific method, enabling them to make informed decisions about when and how to apply it in their own work.



By the end of the workshop, participants will be able to identify and integrate multiple data sources into their decision-making process with confidence and accuracy, thereby improving the quality of their decision-making outcomes.

# Organized assessment projects into three themes



1) Demonstrating impact, 2) understanding students' characteristics, 3) identifying patrons' needs



Themes will be presented guided by the questions next.

Research questions

Dataset used

Statistical analysis and tool

Implications

Limitations



Exercise and Discussion:

How could you have approached the research or project differently to address the research questions?

How does this apply to your work at your library?

What questions does this prompt for you?

# Background

Public research university

- 33,000 students enrolled in 16 colleges



## About students (as of spring 2023)

**63%** Undergraduates

**55%** Female

**93%** Commuters

**20%** First generation college student

**30%** Pell Grant recipients

**31%** White, **26%** Hispanic, **18%** Asian, **11%** International, and **8%** Black

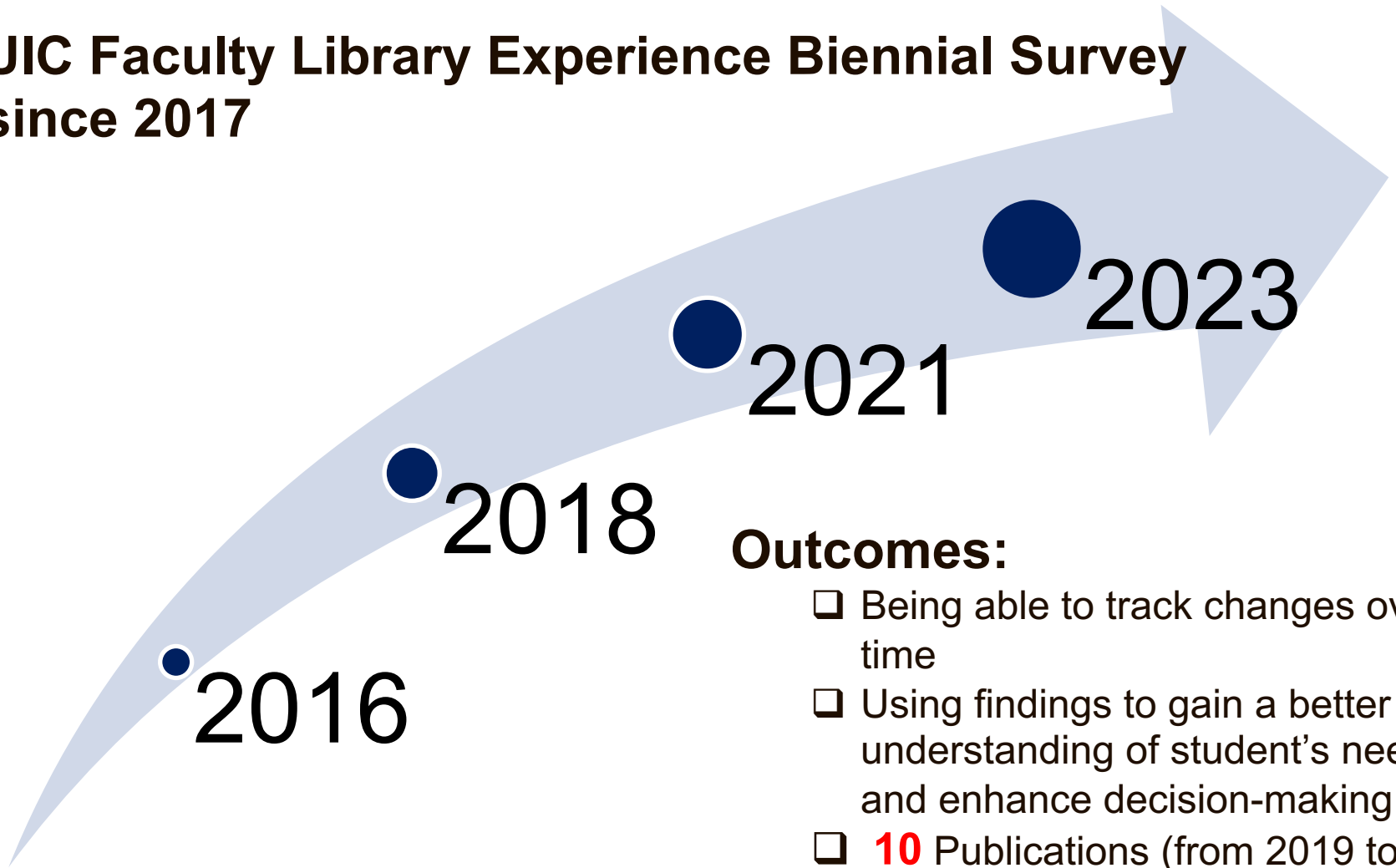
## Locations:

- Daley Library - Chicago
- Library of the Health Sciences - Chicago
- Law School – Loop campus
- Regional health science locations in Peoria and Rockford

# Ongoing Assessment

**UIC Students Library Experience Biennial Survey since 2016 (shown graph)**

**UIC Faculty Library Experience Biennial Survey since 2017**



## Outcomes:

- Being able to track changes over time
- Using findings to gain a better understanding of student's needs and enhance decision-making
- 10** Publications (from 2019 to 2022)





# Theme 1: Demonstrating impact

- **Scoulas, J. M., & De Grootte, S. L. (2023).** Faculty perceptions, use, and needs of library resource and services in a public research university. *Journal of Academic Librarianship*, 49(1), 102630. <https://doi.org/10.1016/j.acalib.2022.102630>
- **Scoulas, J. M., & De Grootte, S. L. (2021).** University Students' Library Experience and Its Impact on Their GPA During the Pandemic. *Journal of Library Administration*, 61(7), 813-837. <https://doi.org/10.1080/01930826.2021.1972730>
- **Lauseng, D. L., Howard, C., Scoulas, J. M., & Berry, A. (2021).** Assessing Online Library Guide Use and Open Educational Resource (OER) Potential: An Evidence-Based Decision-Making Approach. *Journal of Web Librarianship*, 15(8), 128-153. <https://doi.org/10.1080/19322909.2021.1935396>
- **De Grootte, S. L., Aksu Dunya, B., Scoulas, J.M., & Case, M. M. (2020).** Research Productivity and Its Relationship to Library Collections. *Evidence Based Library and Information Practice*, 15(4), 16–32. <https://doi.org/10.18438/eblip29736>
- **Scoulas J. M., & De Grootte S. L. (2020).** University Students' Changing Library Needs and Use: A Comparison of 2016 and 2018 Student Surveys. *Evidence Based Library and Information Practice*, 15(1), 59-89. <https://doi.org/10.18438/eblip29621>
- **Scoulas, J.M & De Grootte, S.L. (2019).** The Library's Impact on University Students' Academic Success and Learning. *Evidence Based Library and Information Practice*, 14(3), 2-27. <https://doi.org/10.18438/eblip29547>

# Theme 1: Demonstrating impact (1)

Scoulas, J.M & De Groote, S.L. (2019). The Library's Impact on University Students' Academic Success and Learning. *Evidence Based Library and Information Practice*, 14(3), 2-27. <https://doi.org/10.18438/ebliip29547>

## Research questions:

Q1. What are the relationships among students' library visits, use of library resources, and their students' Grade Point Average (GPA)?

Q2. How do students perceive the academic library impact on their learning?



# DEMONSTRATING IMPACT (1)

## Research questions:

Q1. What are the relationships among students' library visits, use of library resources, and their students' Grade Point Average (GPA)?

Q2. How do students perceive the academic library impact on their learning?

## Methods:

- Online survey in Qualtrics (9 multiple choice questions and 1 open-ended question)
- Students' demographics including GPA from Office of Institutional Research
- Independent variable: Library visits, use of library resources (Ordinal variable- 0. Never to 4. Daily)
- Dependent variable: GPA (Continuous variable)
- Statistical analysis and tool:
  - Q1. Spearman's rank correlation in SPSS
  - Q2. Thematic analysis in Nvivo

# DEMONSTRATING IMPACT (1)

## **Key findings:**

Q1. student library visits and library space satisfaction were negatively associated with their GPA, whereas most students' use of library resources (e.g., journal articles and databases) was positively associated with their GPAs.

Q2. Students perceived the library as a place where they can concentrate and complete their work

## **Implications:**

- 1) Being able to track changes over time
- 2) Using findings to gain a better understanding of student's needs and enhance decision-making

## **Limitations:**

No casual relationship

# EXERCISE 1

Purpose	Questions	Statistical analysis	Independent variable	Dependent variable
Exploring relationships	What is the relationship between library users and dropout rates from classes		One categorical variable Library users (Yes/No)	One categorical variable Dropout/complete class (Yes/No)
	Is there a relationship between total numbers of library instructions class and their GPA?		One continuous variable- total numbers of library instructions classes	One continuous variable

# ANSWERS FOR EXERCISE 1

Purpose	Questions	Statistical analysis	Independent variable	Dependent variable
Exploring relationships	What is the relationship between library users and dropout rates from classes	Chi-square	One categorical variable Library users (Yes/No)	One categorical variable Dropout/complete class (Yes/No)
	Is there a relationship between total numbers of library instructions class and their GPA?	Pearson correlation	One continuous variable- total numbers of library instructions classes	One continuous variable

# DEMONSTRATING IMPACT (2)

Lauseng, D. L., Howard, C., Scoulas, J. M., & Berry, A. (2021). Assessing Online Library Guide Use and Open Educational Resource (OER) Potential: An Evidence-Based Decision-Making Approach. *Journal of Web Librarianship*, 15(8), 128-153. <https://doi.org/10.1080/19322909.2021.1935396>

## Research questions:

- Q1. How many users visited the EBM guides during a specific time period?
- Q2. Are there any differences in the mean scores of confidence between first-time and repeat users in the EBM guides?



# DEMONSTRATING IMPACT (2)

## Research questions:

Q1. How many users visited the EBM guides during a specific time period?

Q2. Are there any differences in the mean scores of confidence between first-time and repeat users in the EBM guides?

## Methods:

- Usage statistics from Google Analytics and online survey in Qualtrics
- Statistical analysis and tool:
  - Q1. Descriptive statistics
  - Q2. Independent Samples T-test (differences between first time users and repeated users) in SPSS
  - Independent variable: first time users vs. repeated users (one categorical variable)
  - Dependent variable: confidence scores (one continuous scores)

# DEMONSTRATING IMPACT (2)

## **Key findings:**

Q1. During fall 2019, the EBM guide was visited by 45,324 Users, for 53,616 Sessions, and 67,405 Pageviews

Q2. The mean scores of confidence between first-time and repeat users have a statistically significant difference on three guide pages.

**Implications:** The high number of non-UIC, educational users and the self-reported successful learning outcomes reinforce the conversion of the EBM guide to a fully Open Educational Resource (OER).

## **Limitations:**

Low response rate

# DISCUSSION



How could you have approached the research or project differently to address the research questions?



How does this apply to your work at your library?



What questions does this prompt for you?

## Theme 2: UNDERSTANDING STUDENTS' CHARACTERS

- **Scoulas, J. M. (2022).** First-year college students' library experience and its impact on their perceptions of academics during the pandemic. *College and Undergraduate Libraries*, 29(1–2), 54–77. <https://doi.org/10.1080/10691316.2022.2087201>
- **Scoulas, J. M. (2021).** College students' perceptions on sense of belonging and inclusion at the academic library during COVID-19. *The Journal of Academic Librarianship*, 47(6), 102460. <https://doi.org/10.1016/j.acalib.2021.102460>
- **Scoulas, J. M. (2021).** STEM undergraduate students: library use, perceptions and GPA, *Performance Measurement and Metrics*, 22(2), 137-148. <https://doi.org/10.1108/PMM-04-2020-0021>



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**Scoulas, J. M. (2021).** STEM undergraduate students: library use, perceptions and GPA, *Performance Measurement and Metrics*, 22(2), 137-148.

<https://doi.org/10.1108/PMM-04-2020-0021>

### **Research questions:**

- Are there significant differences in students' perceptions of the importance of library resources and services between undergraduate students in STEM and non-STEM disciplines?



# UNDERSTANDING STUDENTS' CHARACTERS

## **Research questions:**

- Are there significant differences in students' perceptions of the importance of library resources and services between undergraduate students in STEM and non-STEM disciplines?

## **Methods:**

- Reanalyze the data that were collected from the research project
- Statistical analysis and tool:
  - Independent variable: STEM and non-STEM disciplines (categorical variable)
  - Dependent variable: perceptions of the importance (continuous variable)
  - Mann–Whitney U(MWU) test in SPSS

# UNDERSTANDING STUDENTS' CHARACTERS

## **Key findings:**

STEM respondents considered specific library resources (subject and course guides, library instructions and library workshops) less important than non-STEM respondents. However, there were no statistical differences in how STEM and non-STEM respondents value other resources.

## **Implications:**

The current study's finding provides evidence that students' preference of specific library resources varies between STEM and non-STEM disciplines

## **Limitations:**

Lack of implications

# EXERCISE 2

Purpose	Questions	Statistical analysis	Independent variable	Dependent variable
Comparing groups	Are non-library users more likely to drop out of class than library users?		One categorical variable Library users (Yes/No)	One categorical variable Dropout/complete class (Yes/No)
	Is there difference in the difficulty of library website use who are aged 23 and under, 24-30, and 30+?		One categorical variable (three levels) age group (aged 23 and under, 24-30, and 30+)	One continuous variable (level of difficulty in using library website)

# ANSWERS FOR EXERCISE 2

Purpose	Questions	Statistical analysis	Independent variable	Dependent variable
Comparing groups	Are non-library users more likely to drop out of class than library users?	Chi-square	One categorical variable Library users (Yes/No)	One categorical variable Dropout/complete class (Yes/No)
	Is there difference in the difficulty of library website use who are aged 23 and under, 24-30, and 30+?	ANOVA	One categorical variable (three levels) age group (aged 23 and under, 24-30, and 30+)	One continuous variable (level of difficulty in using library website)

# DISCUSSION



How could you have approached the research or project differently to address the research questions?



How does this apply to your work at your library?



What questions does this prompt for you?



# Theme 3: IDENTIFYING USERS' NEEDS & DECISION-MAKING

- **Scoulas, J. M.**, Carrillo, E. & Naru, L. (2022). Pandemic-Era Administrative Decision-making informed by patron and employee feedback, *Journal of Library Administration*, 62(6), 753–770.  
<https://doi.org/10.1080/01930826.2022.2102378>
- **Scoulas, J. M.**, Carrillo, E. & Naru, L. (2021). Assessing User Experience: Incorporating Student Voice in Libraries' Pandemic Response, 61(6), 686-703. *Journal of Library Administration*, DOI:  
[10.1080/01930826.2021.1947058](https://doi.org/10.1080/01930826.2021.1947058)
- **Scoulas, J. M.**, Carrillo, E., & Naru, L. (2021). Student Voice in Administrative Decision-Making: Inclusive Planning during the Pandemic. *Journal of Library Administration*, 61(4), 1–18.  
<https://doi.org/10.1080/01930826.2021.1906554>



# Theme 3: IDENTIFYING USERS' NEEDS & DECISION-MAKING

**Scoulas, J. M., Carrillo, E., & Naru, L. (2021).** Student Voice in Administrative Decision-Making: Inclusive Planning during the Pandemic. *Journal of Library Administration*, 61(4), 1–18.  
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**Purpose of the assessment project:** To understand students' concerns about safety and health and use those findings for its reopening plans for Fall 2020.

# IDENTIFYING USERS' NEEDS & DECISION-MAKING

## Methods:

- 12 focus group sessions (56 participants) in June 2020
- Thematic analysis in Excel with task force members
- Focused on reliability of the coding

## Key findings:

- Security guards monitoring compliance with safety guidelines in the library
- Participants: Half of the participants were strongly against having security guards in the library: they argued that guards are intimidating, aggressive, and make students uncomfortable. They also expressed that there should not be policing in the library at this time. The other half felt that security guards were acceptable with some conditions, saying they were in favor of having security guards as a “last resort,” “not all the time,”

## Implications

- Assigned staff and train compliance monitors
- The student focus group responses strengthened the library's commitment to enforcing health safety guidelines and contributed to important decisions on how to monitor and maintain compliance with new protocols in ways that would be acceptable to patrons

# DISCUSSION



How could you have approached the research or project differently to address the research questions?



How does this apply to your work at your library?



What questions does this prompt for you?

# Articles used during workshops

## **Theme 1: Demonstrating Impact (1-2)**

Scoulas, J.M & De Groote, S.L. (2019). The Library's Impact on University Students' Academic Success and Learning. *Evidence Based Library and Information Practice*, 14(3), 2-27. <https://doi.org/10.18438/eblip29547>

Lauseng, D. L., Howard, C., Scoulas, J. M., & Berry, A. (2021). Assessing Online Library Guide Use and Open Educational Resource (OER) Potential: An Evidence-Based Decision-Making Approach. *Journal of Web Librarianship*, 15(8), 128-153. <https://doi.org/10.1080/19322909.2021.1935396>

## **Theme 2: Understanding students' characters**

Scoulas, J. M. (2021). STEM undergraduate students: library use, perceptions and GPA, *Performance Measurement and Metrics*, 22(2), 137-148. <https://doi.org/10.1108/PMM-04-2020-0021>

## **Theme 3: Identifying users' needs & decision-making**

Scoulas, J. M., Carrillo, E., & Naru, L. (2021). Student Voice in Administrative Decision-Making: Inclusive Planning during the Pandemic. *Journal of Library Administration*, 61(4), 1–18. <https://doi.org/10.1080/01930826.2021.1906554>

# APPENDIX

- **Scoulas, J. M., & De Groote, S. L.** (2023). Faculty perceptions, use, and needs of library resource and services in a public research university. *Journal of Academic Librarianship*, 49(1), 102630. <https://doi.org/10.1016/j.acalib.2022.102630>
- **Scoulas, J. M., Carrillo, E. & Naru, L.** (2022). Pandemic-Era Administrative Decision-making informed by patron and employee feedback, *Journal of Library Administration*, 62(6), 753–770. <https://doi.org/10.1080/01930826.2022.2102378>
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- **Scoulas, J. M., & De Groote, S. L.** (2021). University Students' Library Experience and Its Impact on Their GPA During the Pandemic. *Journal of Library Administration*, 61(7), 813-837. <https://doi.org/10.1080/01930826.2021.1972730>
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- **Scoulas, J.M., Aksu Dunya, B., & De Groote, S.L.** (2021). Validating students' library experience survey using Rasch Model. *Library and Information Science Research*, 43(1), 101071. <https://doi.org/10.1016/j.lisr.2021.101071>
- De Groote, S. L., Aksu Dunya, B., **Scoulas, J.M.**, & Case, M. M. (2020). Research Productivity and Its Relationship to Library Collections. *Evidence Based Library and Information Practice*, 15(4), 16–32. <https://doi.org/10.18438/eblip29736>
- **Scoulas, J.M., De Groote, S. L., & Dempsey, P. R.** (2020) Learning from data reuse: successful and failed experiences in a large public research university library, *IASSIST Quarterly* 44(1-2), pp. 1-15. <https://doi.org/10.29173/iq966>
- Carrillo, E & **Scoulas, J.M** (2020). Welcome to the Library: Data-Driven Student Worker Empowerment, *Evidence Based Library and Information Practice*, 15(2), 138-142. <https://doi.org/10.18438/eblip29728>
- **Scoulas, J.M** (2020). Using Assessment Tools to Develop a Workshop for Library Staff: Establishing a Culture of Assessment, *Evidence Based Library and Information Practice*, 15(2), 150-155. <https://doi.org/10.18438/eblip29709>
- **Scoulas J. M., & De Groote S. L.** (2020). University Students' Changing Library Needs and Use: A Comparison of 2016 and 2018 Student Surveys. *Evidence Based Library and Information Practice*, 15(1), 59-89. <https://doi.org/10.18438/eblip29621>
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# RESOURCES

- Assessment Proficiencies:  
[https://www.ala.org/acrl/standards/assessment\\_proficiencies](https://www.ala.org/acrl/standards/assessment_proficiencies)
- ACRL Learning analytics Toolkit:  
<https://acrl.libguides.com/val/latoolkit>
- ACRL Library Advocacy Toolkit:  
<https://acrl.libguides.com/advocacytoolkit>



# CONTACT

Jung Mi Scoulas, [jscoul2@uic.edu](mailto:jscoul2@uic.edu) for questions, future collaboration or submitting contribution to column of strategic planning and assessment at the Journal of Library Administration.

