IDENTIFYING CONNECTIONS WITHIN THE LITERATURE ON STEM INSTRUCTIONAL CHANGE USING AN HISTORIOGRAPHIC APPROACH

ANDREA BEACH AND CHARLES HENDERSON
WESTERN MICHIGAN UNIVERSITY
Purpose

- This poster presents preliminary results of a citation analysis of 384 journal articles and books on strategies and ideas about how to promote change in instructional practices used in undergraduate STEM courses.

- **Research Questions:**
  - To what extent do authors of instructional change studies in the SER, HER, and FDR communities cite the work of other studies WITHIN their community?
  - To what extent do authors of instructional change studies in the SER, HER, and FDR communities cite the work of authors OUTSIDE their community?
  - Are there common earlier studies or publications that all communities draw from, and if so, what issues do they address?
Data

- 384 journal articles and books that address instruction or change from the perspective of faculty practice outcomes
- Chosen from key word searches in Web of Science and ERIC, and from searches of article reference lists.
- Reference information plus cited reference lists were entered into a HistCite Historiographic database for analysis.
HistCite is a software package that uses an historiographic algorithm to trace connections among the cited references of published journal articles. (HistCite, n.d.)

HistCite offers several “scores” for individual articles:

- the number of cited references (CR) within a record;
- the number of locally cited references (LCR – cited references that are also records themselves in the database);
- the Local Citation Score (LCS – number of times a record is cited by other records in the database) and
- Global Citation Score (GCS – number of times a record is cited in the Web of Science).
Results

- 115 citations are cited by at least 1 other (LCS>0). The highest is 20 (Trigwell, Prosser, & Taylor, 1994).
- 109 cite at least one other (LCR>0). The highest is 13 (Henderson & Dancy, 2008).
- Combined, these categories yield 177 citations connected to at least one other citation. That is 46% of the 384 resources in the database.
- Only 28 resources have LCS or LCR greater than 5 citations (7% of the database).
Results – Few Clusters

- SER cluster – Briscoe, 1991 is the most highly cited, and this group has some interconnections.
- FDR clusters – The Trigwell/Prosser group has the most interconnections (many to later pieces by the same author group or their larger research team. Also some much smaller, more isolated groupings
- HER cluster – anchored by Alpert, 1985
- Overall, there is very little evidence of a common set of literature informing research and practice within or between research communities.
Discussion/Conclusion

- Very little citation within or across research groups
  - Few clusters of citations within research communities
  - Fewer clusters of cross-citations
- Few foundational pieces upon which the literatures build.
- One large grouping (Trigwell, Prosser, et al.) that represents the kind of relationships that create a foundation for further theory-building and theory-testing.