MEDICAL COLLEGE OF WISCONSIN

KERN INSTITUTE
FOR THE TRANSFORMATION OF MEDICAL EDUCATION

AN INTERNATIONAL STUDY OF COGNITIVE APPRENTICESHIP IN PHARMACY EDUCATION

Innovations in Healthcare Education Research Conference

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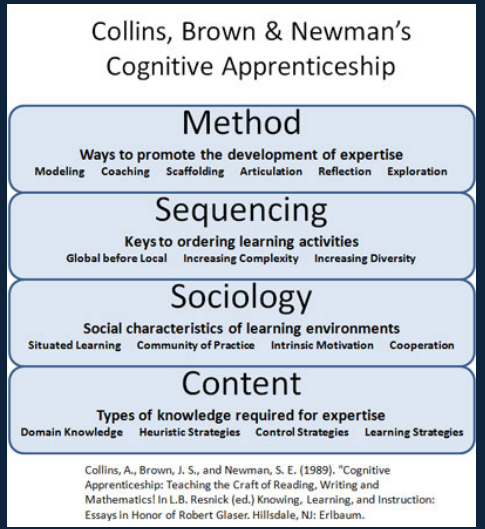
COGNITIVE APPRENTICESHIP: INTRO

Making expert thinking visible

Experts often neglect to make their thinking visible to learners

- Teaching requires the externalization of processes typically carried out internally
- Each dimension has corresponding sub-dimensions that provide ways for educators to implement the CA framework into their everyday teaching practice
- Educators can use CA domains to design a learning environment that supports learners in their development of expertise



COGNITIVE APPRENTICESHIP: HEALTH PROFESSIONS

- A small, but growing number of studies explore its use in the health professions (Lyons et al., 2017)
  - Primarily applied and studied in clinical learning environments
  - Strongest focus on Cognitive Apprenticeship (CA)-Methods domain
- **Purpose of our study:** identify aspects of the CA framework that pharmacy educators use in their didactic teaching practice
  - RQ 1. Which **dimensions and sub-dimensions of CA** are most commonly utilized within didactic learning environments?
  - RQ 2. Which **teaching activities and practices** are used within didactic learning environments that align with the dimensions and sub-dimensions of CA?
- *Observational, retrospective design using pre-recorded videos*

METHODOLOGY

Data Sources

- **Videos of 17 educators** from 3 schools of pharmacy (2 in United States & 1 in Australia)
- **58** class sessions from **23** courses across 3 years of pharmacy curricula
- Topics ranged from foundational (e.g. biostatistics) to advanced (e.g. pharmacotherapy)
- Data from sessions taught 2017-2019

Data Structure

- **58 videos**: 37 pre-class & 21 in-class
- **Total: 1,553 minutes**
- **Range:** ~1 minute (pre-class video) to 89 minutes (in-class video)
- **Length**: 26.8 ± 24.8 minutes (mean ± st dev)

Data Analysis

- Deductive coding using CA Framework as codes
- Single researcher coded entire data set and 4 trained student researchers coded 70% of the data set (inter-coder agreement was >80%
- Peer debriefing conducted with research team

RQ1 FINDINGS: MOST COMMONLY UTILIZED CA DIMENSIONS

CA Dimension	Pre-class (N=37 videos) **373 minutes** Codes: n(%)	In-class (N=21 videos) 1,170 minutes Codes: n(%)	Total (N=58 videos) 1,553 minutes Codes: n(%)
Content	22(7.8%)	79(4.6%)	101(5.0%)
Methods	**153(54.8%)**	**1,003(58.9%)**	**1,156(58.2%)**
Sequencing	50(17.9%)	52(3.0%)	102(5.1%)
Sociology	**54(19.3%)**	**573(33.5%)**	**627(31.5%)**
Total number	279(100%)	1,707(100%)	1,986(100%)

- Instructors were observed primarily using the **Methods** (58.2%) and **Sociology** (31.5%) to explicate their thinking to learners
- **Methods** most frequent dimension observed in pre- and in-class
- **Sociology** more frequently observed in-class (33.5%) than pre-class (19.3%)
- **Sequencing** more frequently observed pre-class (17.9%) than in-class (3.0%)

RQ2 FINDINGS: TEACHING PRACTICES

- Numerous teaching patterns emerged from the data
- Some patterns demonstrated structured teaching activities that were designed and implemented in-class
- Other patterns were more spontaneous in delivery

Structured CA In-class patterns	Example
Domain Knowledge/Explanation → Reflection/Articulation → Collaboration → Community of Practice → Explanation	**Think, Pair, Share** *Faculty presented domain knowledge → Faculty asked an application question → Learners talked in small groups → Learners shared with class → Faculty expanded on learner responses*
Reflection/Articulation & Situated Learning → Modeling → Collaboration → Coaching/Scaffolding → Community of Practice → Coaching	**Concept Map Development** *Learners tasked with creating a concept map of acute kidney rejection based upon a case study → Faculty provided an example of a concept map → Learners worked in groups → Faculty made whole class announcement about expectations for the concept map → Learners shared concept maps with class → Faculty provided feedback during whole class discussion*
Spontaneous CA pattern	**Example**
Community of Practice → Explanation	**Faculty Responding to Learner Questions** *Learner asks faculty a content question → Faculty responds to learner inquiry*

IMPLICATIONS

- This study serves as a **first step** in determining how various teaching practices of pharmacy educators map to the CA framework
- Findings highlight the **use of active learning** teaching strategies within pharmacy curricula
- Results show **variability in strategies** used pre-class and in-class
- By including multiple institutions, educators, and class topics, this study produced a **foundational understanding** of teaching practices pharmacy instructors use to make expert thinking visible
- The findings support the development of a **standardized language for discussing teaching practices**

NEXT STEPS

- Examine strategies faculty use in **sequential pre- and in-class sessions**
- Examine **additional areas of teaching**, such as preparation, implementation, and assessment to gain insight into all facets of teaching in pharmacy
- Efforts should focus on **why sequencing is less frequently observed** than other CA dimensions
- **Additional schools of pharmacy** will be included to expand the sample and gain additional insight into the CA framework in pharmacy education

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Additional Resources

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