4-22-2022

Analysis of Undergraduate Mathematics Coursework for Curriculum Design

Marissa Maldonado  
*Boise State University*

Laurie Cavey  
*Boise State University*
Analysis of Undergraduate Mathematics Coursework for Curriculum Design

Abstract
Andragogy is the study of adult education and is an area of research that is neglected within university environments. There is a lack of curriculum/documentation analysis relative to increasingly modern formats of upper-division mathematics courses by use of technology and real-world applications. In finding proper modes of transportation for abstract mathematical concepts, teachers can make more informed approaches to teaching and developing curriculums at a university level. A case study will be conducted that compares the final group projects of a mathematical modeling course in alignment with assignment instructions, available documentation, and recorded lectures. This case study will give insight into how epistemology can be implemented into advanced, abstract mathematics courses for adult learners.
Introduction and Motivation:
- Andragogy is the study of adult education and is an area of research that is limited within university environments.
- Therefore, assessing course documentation could give insight to "effective student learning" (Hoyles & LaGrange, 2010).
- To what extent does an investigation of the andragogy of a mathematical modeling course inform curriculum design for undergraduate mathematics courses?

Methods:
- Anonymized students
- Undergraduate Mathematics Modeling course
- Data were collected from assignment submissions and resulting scores
- Examined through the lens of principles of andragogy

Current Challenge:
- lack of empirical investigation related to andragogy
- heavily saturated with anecdotal evidence
- relevant data needs to be redirected to correlation with andragogical principles (Wilson, 2005).

Comparison of Learning Theories (Knowles, 1984)

Pedagogy
- Adolescent education
- Student dependence on the guidance of teacher
- Teacher-oriented classroom
- Motivated by external pressures

Andragogy
- Higher education
- Self-directed study
- Student-oriented classroom
- Problem-centered orientation of learning

References
C. Hoyles and J.-B. Lagrange (2010), Mathematics Education and Technology-Rethinking the Terrain, Springer.