

Designing Authentic Assessments for Learning

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Enhancing Assessment Practices

- Scoping review of literature on assessment in STEM
- Results in 5 categories:
 1. Quizzes/Tests
 2. Assignments/Projects
 3. In-Class Assessments
 4. Self-Learning/Mastery Grading
 5. Communication/Other

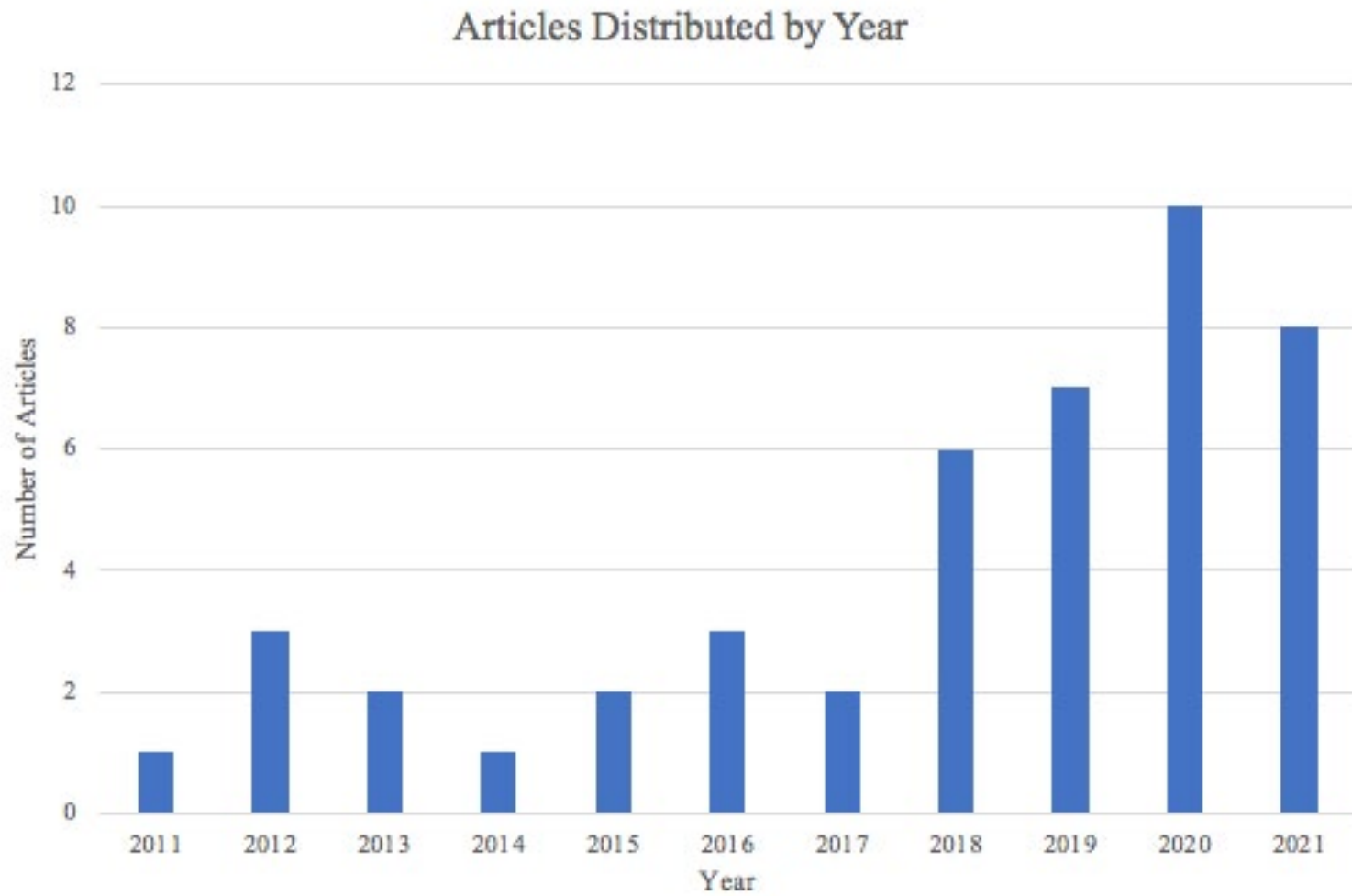
Scoping Review Process

- Research question:
 - What is known from existing literature about practices for educators to assess students in undergraduate STEM education?
- Search strategy and terms:
 - ERIC database, “Assessment” AND “STEM or Math”
 - Peer reviewed, higher ed, English only
- Screening process:
 - 766 abstracts read -> 103 papers fully read -> 45 included

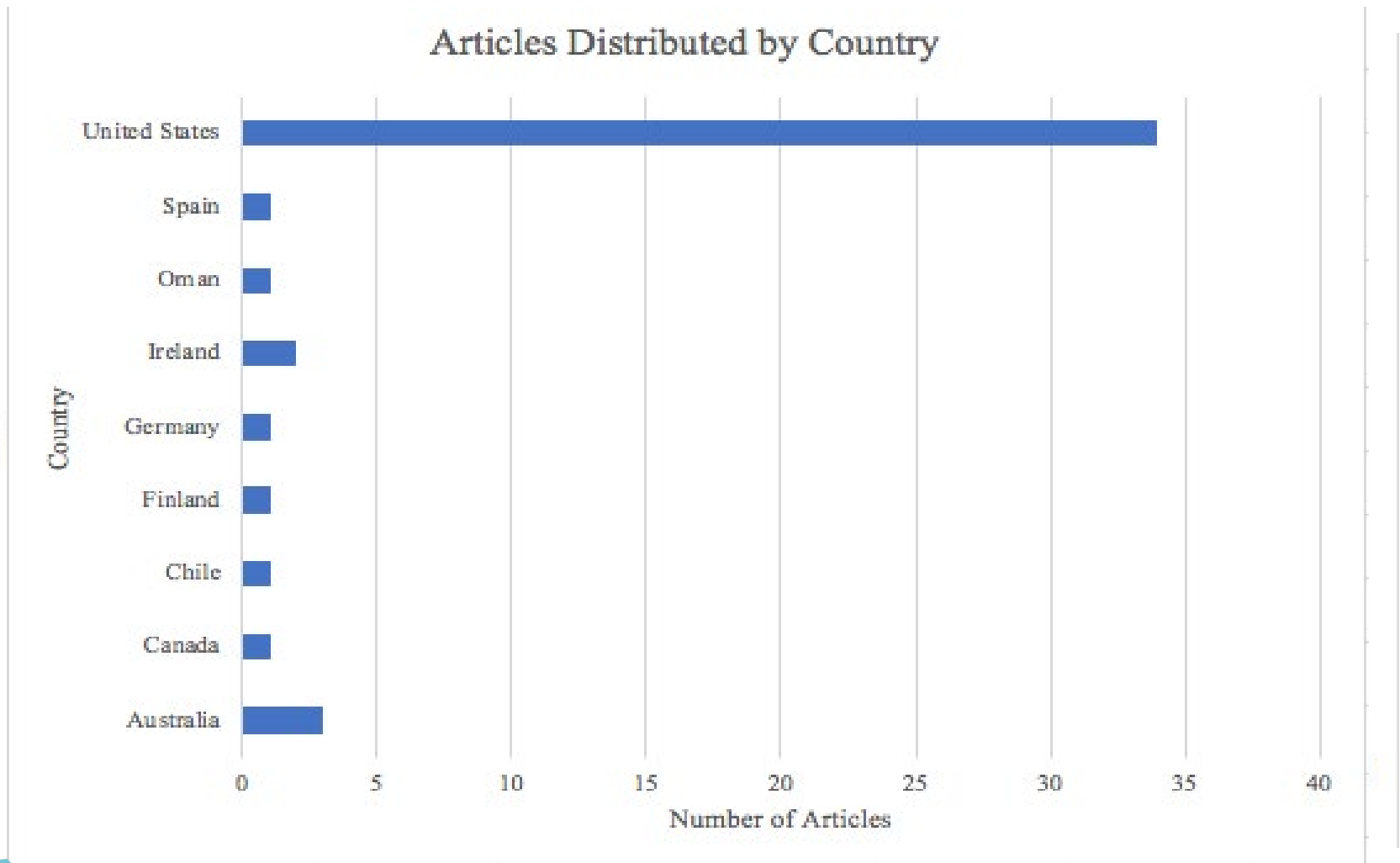
Data Charted

- Article info: title, author(s), year of publication, journal of publication, source
- Instructional context: subject(s) or course, class size, number respondents, institution(s), country, course delivery modality
- Study details: purpose of the study, type(s) of assessment used, the goal behind the assessment(s), results
- Potential application: extra resources, best practices, limitations, instruments used

Paper Demographics

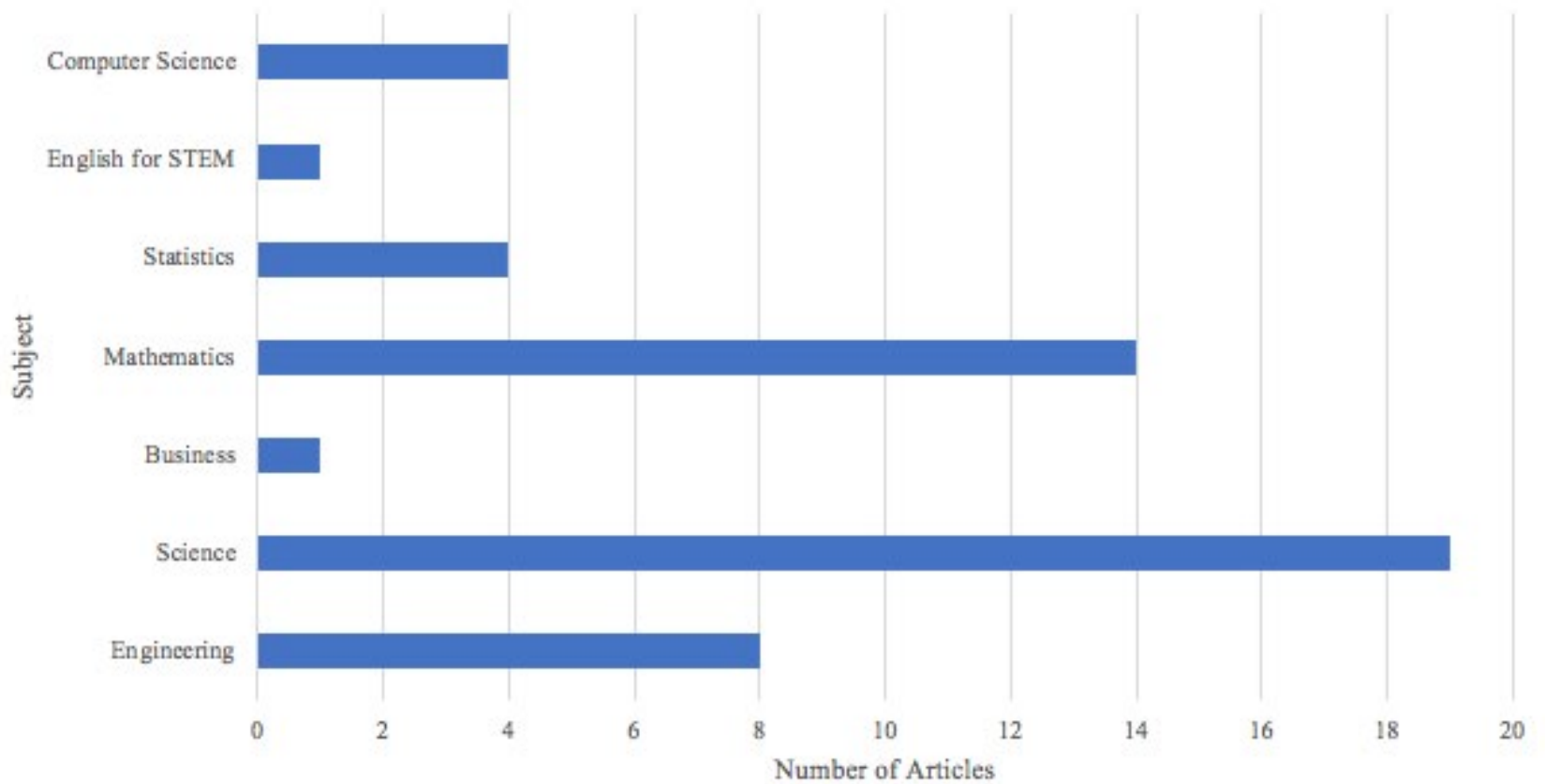


Paper Demographics



Paper Demographics

Articles Distributed by Subject



Paper Demographics



1. Quizzes/Tests

- No performance gap in computer vs paper delivery
 - Some benefits of computer (multiple attempts)
- Questions
 - Student-written questions
 - Longer sentences hinder understanding
- Preparation
 - Practice tests/questions
 - Reference sheet vs open book

2. Assignments/Projects

- Topic choices
 - Student interests
 - Agency increases engagement
- Scaffolding
 - Provide support and feedback
 - Several short projects more effective than one long one
 - Exemplars

3. In-Class Assessments

- In-class multiple choice quizzes
 - No difference if images are present
- Hands-on activities
 - Labs, worksheets, scenario discussions
- Rubrics
 - Students clarify learning goals

4. Self-Learning/Mastery Grading

- Optional test re-takes
 - Various grading options, less inflationary pressure
 - Grades improved, mixed effect on anxiety, increased time
- Mastery grading
 - Multiple attempts to achieve mastery of learning outcomes
 - Reduced anxiety, requires clear objectives
- Self-assessment
 - Correlation with instructor grades mixed
 - Guidance and feedback essential

5. Communication/Other

- Oral exams
 - Students can better articulate understanding
- Writing exercises
 - Short in-class activities improved exam performance
- Group video assignments
 - Developed effective digital communication skills

Key Takeaways

- Research supports the use of authentic assessments to enhance student learning
- Perceived efficacy and quality feedback are essential
- Try it and encourage your colleagues to do it too!

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