Student Success Initiatives in the Classroom

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Associate Professor of Mathematics
What we know.

Remediation: The effect of attrition.

Students assigned 3 or more semesters of math remediation.

- Completed 1st semester of remediation.
- Completed 2nd semester of remediation.
- Completed 3rd semester of remediation.
- Passed gateway course.

Enrolled and completed | Did not complete | Did not enroll or stopped enrolling

LOST

KNOW THIS: The remediation system is broken. More students quit than fail.

# Algebra Skills needed for Statistics

## Table of Contents from a traditional Elementary & Intermediate Algebra text

- **Chapter 1: Some Basic Concepts of Arithmetic and Algebra**
  - 1.1: Numerical and Algebraic Expressions (22)
  - 1.2: Prime and Composite Numbers (20)
  - 1.3: Integers, Addition and Subtraction (22)
  - 1.4: Integer Multiplication and Division (21)
  - 1.5: Use of Properties (21)

- **Chapter 2: The Real Numbers**
  - 2.1: Rational Numbers, Multiplication and Division (20)
  - 2.2: Real Numbers and Algebraic Expressions (21)
  - 2.3: Exponents (27)
  - 2.4: Translating from English to Algebra (22)

- **Chapter 3: Equations, Inequalities, and Problem Solving**
  - 3.1: Solving First Degree Equations (20)
  - 3.2: Equations and Problem Solving (21)
  - 3.3: More on Solving Equations and Problem Solving (21)
  - 3.4: Equations Involving Parentheses and Fractional Forms (2)
  - 3.5: Inequalities (21)
  - 3.6: Inequalities, Compound Inequalities, and Problem Solving

- **Chapter 4: Formulas and Problem Solving**
  - 4.1: Ratio, Proportion, and Percent (27)
  - 4.2: More on Percent and Problem Solving (21)
  - 4.3: Formulas, Geometry, and Others (21)
  - 4.4: Problem Solving (20)
  - 4.5: More About Problem Solving (22)

- **Chapter 5: Coordinate Geometry and Linear Systems**
  - 5.1: Cartesian Coordinate System (22)
  - 5.2: Graphing Linear Equations (22)
  - 5.3: Slope of a Line (22)
  - 5.4: Writing Equations of Lines (21)
  - 5.5: Systems of Two Linear Equations (25)
  - 5.6: Elimination-by-Addition Method (20)
  - 5.7: Graphing Linear Inequalities (19)

- **Chapter 9: Exponents and Polynomials**
  - 9.1: Addition and Subtraction of Polynomials (20)
  - 9.2: Multiplying Monomials (27)
  - 9.3: Multiplying Polynomials (22)
  - 9.4: Dividing by Monomials (28)
  - 9.5: Dividing by Binomials (27)
  - 9.6: Zeros and Negative Integer as Exponents (21)

- **Chapter 7: Factoring, Solving Equations, and Problem Solving**
  - 7.1: Factoring by Using the Distributive Property (21)
  - 7.2: Factoring the Difference of Two Squares (22)
  - 7.3: Factoring Trinomials to the Form ax^2 + bx + c (21)
  - 7.4: Factoring Trinomials of the Form ax^2 + bx + c (21)
  - 7.5: Factoring, Solving Equations, and Problem Solving (20)

- **Chapter 8: A Transition from Elementary Algebra to Intermediate**
  - 8.1: Equations: A Brief Review (20)
  - 8.2: Inequalities: A Brief Review (26)
  - 8.3: Equations and Inequalities Involving Absolute Value (24)
  - 8.4: Polynomials: A Brief Review and Binomial Expansions
  - 8.5: Dividing Polynomials, Synthetic Division (20)
  - 8.6: Factoring, A Unit Review and a Step Further (20)

- **Chapter 9: Rational Expressions**
  - 9.1: Simplifying Rational Expressions (21)
  - 9.2: Multiplying and Dividing Rational Expressions (21)
  - 9.3: Adding and Subtracting Rational Expressions (20)
  - 9.4: More on Rational Expressions and Complex Fractions
  - 9.5: Equations Containing Rational Expressions (21)
  - 9.6: More on Rational Equations and Applications (20)

- **Chapter 10: Exponents and Radicals**
  - 10.1: Integral Exponents and Scientific Notation Revisited (20)
  - 10.2: Roots and Radicals (20)
  - 10.3: Simplifying and Combining Radicals (21)
  - 10.4: Products and Quotients of Radicals (20)
  - 10.5: Radical Equations (20)
  - 10.6: Making Experiments and Roots (20)

- **Chapter 11: Quadratic Equations and Inequalities**
  - 11.1: Complex Numbers (21)
  - 11.2: Quadratic Equations (20)
  - 11.3: Completing the Square (21)
  - 11.4: The Quadratic Formula (22)
  - 11.5: More Quadratic Equations and Applications (22)
  - 11.6: Quadratic and Other Nonlinear Inequalities (20)

- **Chapter 12: Coordinate Geometry, Lines, Parabolas, Circles, Ellipses, and Hyperbolas**
  - 12.1: Distance, Slope, and Graphing Techniques (24)
  - 12.2: Graphing Parabolas (20)
  - 12.3: More Parabolas and Some Circles (20)
  - 12.4: Graphing Ellipses (20)
  - 12.5: Graphing Hyperbolas (17)

- **Chapter 13: Functions**
  - 13.1: Relations and Functions (21)
  - 13.2: Functions: Their Graphs and Applications (22)
  - 13.3: Graphing More Easy Via Transformations (36)
  - 13.4: Composition of Functions (22)
  - 13.5: Direct Variation and Inverse Variation (20)

- **Chapter 14: Exponential and Logarithmic Functions**
  - 14.1: Exponents and Exponential Functions (25)
  - 14.2: Applications of Exponential Functions (24)
  - 14.3: Inverse Functions (22)
  - 14.4: Logarithms (20)
  - 14.5: Logarithmic Functions (20)
  - 14.6: Exponential Equations, Logarithmic Equations, and Problem Solving (30)

- **Chapter 15: Systems of Equations: Matrices and Determinants**
  - 15.1: Systems of Two Linear Equations, A Brief Review (20)
  - 15.2: Systems of Three Linear Equations in Three Variables (23)
  - 15.3: A Matrix Approach to Solving Systems (22)
  - 15.4: Determinants (23)
  - 15.5: Cramer's Rule (22)
  - 15.6: Systems Involving Nonlinear Equations (20)
Examples of Models

**Paired Course Model**
- Provides support skills in a separate course aligned to the learning objectives of the gateway course. The separate course is paired with the gateway course and delivered in the same semester.

**101 Plus Model**
- Offers academic support as an extension of the gateway course.

**Technology-Mediated Model**
- Requires students to complete online lab support.
How many instructors at your institution know the bookstore cost of materials for their course?

Understanding the issues of cost.
There is a direct relationship between textbook costs and student success:

- 66.5%+ do not purchase textbooks at some point due to cost
- 47.6% take fewer courses due to textbook cost
- 45.5% choose not to register for a course due to textbook cost
- 37.6% earn a poor grade
- 26.1% have dropped a course due to textbook cost
- 19.8% have withdrawn from a course due to textbook cost

Source: 2016 student survey by Florida Virtual Campus
Resources.

WHERE TO GO

Open Textbook Network

Openstax College

Boundless

OER Commons

Open Textbook Library

LIBRETEXTS

Open Textbooks

SUNY OER Services

WIKIBOOKS

Open Course Library

Download, remix, teach

CENTRAL OHIO TECHNICAL COLLEGE
Create, adopt, and utilize open materials for many of Ohio's high enrollment courses.
Hypothesis Testing for the Proportions

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<td><strong>Hypothesis Testing for the Proportions</strong></td>
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<td>3</td>
<td>Null Hypothesis</td>
<td>$H_0: \hat{p} = 0.50000$</td>
<td>Right Tailed Test</td>
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<td>Alternative Hypothesis</td>
<td>$H_1: \hat{p} &gt; 0.50000$</td>
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<td>Sample Proportion $\hat{p}$</td>
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<td>Sample Size $n$</td>
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<td>Level of Significance $\alpha$</td>
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<td><strong>z-Test for Proportion</strong></td>
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<td>11</td>
<td>$z$-score (test statistic)</td>
<td>$-0.88994$</td>
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<td>$z_\alpha$ Critical Value(s)</td>
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<td>$p$-value</td>
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Optional: Use if $p$-hat is not given

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Questions?

Please don’t hesitate to reach out!

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