An Index for Gauging Effectiveness
Measuring Success of Developmental Studies Programs

Anita Polk-Conley and John Squires
Chattanooga State Community College

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The Question

What makes a developmental studies program successful? Choose one. Explain your answer.

- Success in college level courses
- Success in developmental studies courses
Which of these rates are most important?

- Check all that apply:
  1. Dev Course pass rates
  2. Average GPA of Dev students
  3. Dev Program Math pass rates
  4. Other Dev Studies pass rates
Let’s Do the Math

- Basic Math
- Elementary Algebra
- Intermediate Algebra
- College Algebra
- Degree Program
- Chances of Graduating = \(0.5^5 = 0.03125\)

- TBR Study 2007
  - Students starting at the lowest levels of developmental studies have a 3% chance of graduation – in 5 years!
Good or Bad?

Consider the following scenarios for a developmental studies program:

- 30% of students exit the program
- 70% of the students exit the program
- At the college level, students have a 70% success rate
- At the college level, students have a 30% success rate
Gauging Effectiveness

Calculating Developmental Studies Effectiveness

- **Examples**
  - 30% of students exit, succeed at a 70% rate in college
  - 70% of students exit, succeed at a 30% rate in college

- **Observations**
  - The first example fits many dev studies programs
  - Most colleges have an effectiveness between .15 and .25
Prepared for Success

Which of these students is best prepared for college?

- **Student 1**
  - Ch. 1 95  Ch.2  85  Ch.3  70  Ch.4  70  Ch.5  30

- **Student 2**
  - Ch. 1 90  Ch.2  90  Ch.3  50  Ch.4  70  Ch.5  50

- **Student 3**
  - Ch. 1 90  Ch.2  85  Ch.3  65  Ch.4  60  Ch.5  50

- **Student 4**
  - Ch. 1 90  Ch.2  80  Ch.3  75  Ch.4  70  Ch.5  80
Keys to Closing the Gap

- Getting students to Do the Math
- Helping Struggling Students
- Making Sure They Learn the Material – Mastery Learning

*I believe that mastery learning is the critical missing link in the education of low achievers.*

*Patricia K. Cross, 1976 Accent on Learning*
Effectiveness Matters: What if it works?

- Increase in students passing Developmental studies has a direct increase on the numbers of students entering and passing college level courses.

- Increase passing rates for college level increases student retention.
What If It Works? (Chattanooga)

Chattanooga State Math Department

Student Enrollment

Semester
Developmental Studies
Effectiveness Index

- Uses **course success rates** from developmental studies through college level

- Provides a “**snapshot**” of student success in a developmental program thru college level

- **Track effectiveness year to year**

Let’s DO The Math!!
The DSE: Just 4 Steps

• **Step 1:** Course Success Rate, CSR
• **Step 2:** Course Path Rate, CPR
• **Step 3:** Proportion of Developmental Enrollees, PRO
• **Step 4:** The DSE
The DSE: Step 1

- Step 1: Course Success Rate

\[
\text{CSR} = \frac{\text{# of passing grades}}{\text{# of dev students enrolled}} \quad (\text{for each course})
\]

- Example:

\[
\begin{align*}
\text{CSR (Math 0810)} &= 360/720 = 0.50 \quad (\text{DM1}) \\
\text{CSR (Math 0820)} &= 240/480 = 0.50 \quad (\text{DM2}) \\
\text{CSR (Math 1530)} &= 280/400 = 0.70 \quad (\text{College})
\end{align*}
\]
The DSE: Step 2

- **Step 2: Course Path Rate**

CPR = CSR * CSR* CSR...

(success rate in each dev course times college rate)

Example:

CPR (Math 0810) = 0.50 * 0.50* 0.70 = 0.175 (DM1)
CPR (Math 0820) = 0.50 * 0.70 = 0.35 (DM2)
The DSE: Step 3

- Step 3: Proportion of Developmental Enrollees

\[
\text{Pro} = \frac{\# \text{ of enrollees}}{\text{total}} \quad \text{(for each dev course)}
\]

Example:

\[
\begin{align*}
\text{PRO (Math 0810)} &= \frac{720}{1200} = 0.60 \quad \text{(DM1)} \\
\text{PRO (Math 0820)} &= \frac{480}{1200} = 0.40 \quad \text{(DM2)}
\end{align*}
\]
The DSE: Step 4

- Step 4: Developmental Studies Effectiveness Index

\[ \text{DSE} = \text{CPR} \times \text{PRO} + \text{CPR} \times \text{PRO} \ldots \]

(multiply for each course then add)

Example:

\[ \text{DSE} = (0.175 \times 0.60) + (0.35 \times 0.40) = 0.2450 \]

Now change to Percent: Multiply by 100%

\[ 0.2450 \times 100 = 24.50\% \]
The DSE represents

....the percentage of students enrolled in developmental studies who successfully exit developmental and succeed in their first corresponding college course

This means that 24.5% of students enrolled in developmental math actually exit the program and pass a college level math course in the previous example!
What if ...
...developmental studies student success rate increased by 50% to a Course Success Rate of 75% for the same example...

Step 1: CSR  
0.75  
0.75  
0.70

Step 2: CPR  
\(\cdot 0.75 \times 0.75 \times 0.70\)  
\(\cdot 0.75 \times 0.70\)  
= 0.394  
= 0.525

Step 3: PRO  
0.60  
0.40

Step 4: DSE  
\(0.394 \times 0.60\)  
\(0.525 \times 0.40\)  
= 0.4464

...the DSE nearly doubled from 25% to 45%
Things to Remember...

- Collect Data & Use Data
- Do the Math – Know your Success Rates
- Let Data inform Decision making

\[
\text{Increase} \times \text{Increase} = \text{Increase}^2
\]
Questions?

Anita Polk-Conley
Anita.PolkConley@ChattanoogaState.edu

John Squires
John.Squires@ChattanoogaState.edu