

**STRONGER**  
by degrees

## Corequisite Education in Kentucky

Dr. Dawn CheNeen Offutt  
September 26, 2018

Kentucky Council on Postsecondary Education

### Three Focus Areas of the Strategic Agenda



How can Kentucky encourage more people to take advantage of post-secondary opportunities?



How can Kentucky increase degree and certificate completion, fill workforce shortages and guide more graduates to a career path?



How can Kentucky's postsecondary system create economic growth and development and make our state more prosperous?

The strategic agenda can be found at <http://cpe.ky.gov/ourwork/strongerbydegrees.html>



## Co-requisite Implementation – Kentucky's Commitment

- Provided **institutional data on student completion** of gateway courses linked to developmental course enrollment.
- Made **NROC EdReady resources** available to all students needing support enrolled in Kentucky Adult Education, the Kentucky Community and Technical College System (KCTCS), and public universities (2014).
- Provided **funding designated for piloting, implementing and scaling corequisite education** for public postsecondary institutions.
- Provided **professional development conferences and workshop opportunities** for each campus to grow, work, refine, and scale program models.



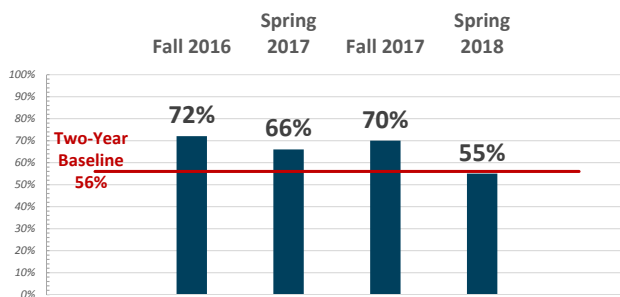
## Co-requisite Implementation – Where Are We Now?

- **All colleges are now in the implementation phase; some have taken corequisite to scale. At least 4,782 students had opportunity and access to corequisite coursework in 2016-17. In fall 2017, over 4,500 students had access to corequisite English, literacy and mathematics courses and over 2700 students for Spring 2018.**
- **Corequisite models include:**
  - **Embedded supports**
  - **Paired support courses**
  - **Boot camps**



### Corequisite Success: Comprehensive Universities

#### English Completion in One Semester

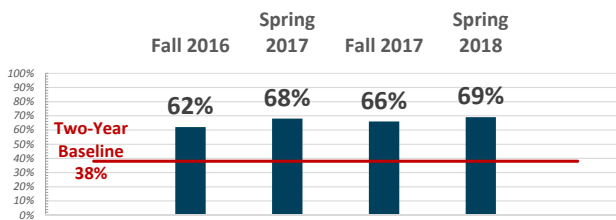


Percentages based on the number of developmental students completing a gateway course in one semester.  
Two-Year Baseline represents students enrolled in a dev. ed. course and then completed a gateway course in two years



### Corequisite Success: Comprehensive Universities

#### College Algebra Completion in One Semester

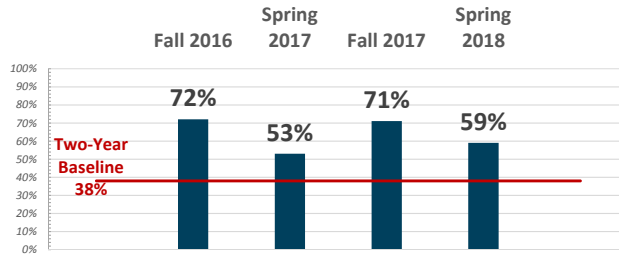


Percentages based on the number of developmental students completing a gateway course in one semester.  
Two-Year Baseline represents students enrolled in a dev. ed. course and then completed a gateway course in two years



### Corequisite Success: Comprehensive Universities

#### Other Gen. Ed. Math Completion in One Semester

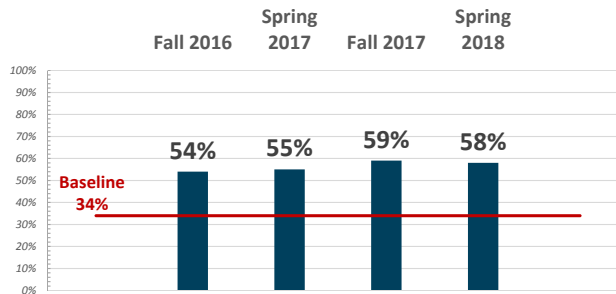


Percentages based on the number of developmental students completing a gateway course in one semester.  
Two-Year Baseline represents students enrolled in a dev. ed. course and then completed a gateway course in two years



### Corequisite Success: KCTCS

#### English Completion in One Semester

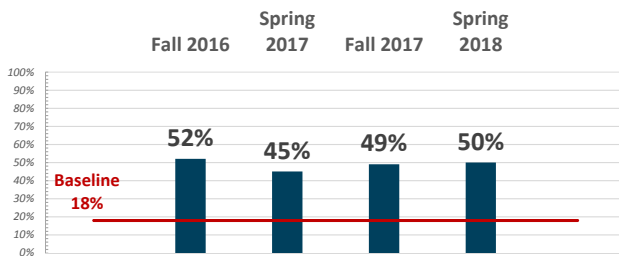


Percentages based on the number of developmental students completing a gateway course in one semester.  
Two-Year Baseline represents students enrolled in a dev. ed. course and then completed a gateway course in two years



Corequisite Success: KCTCS

College Algebra Completion in One Semester

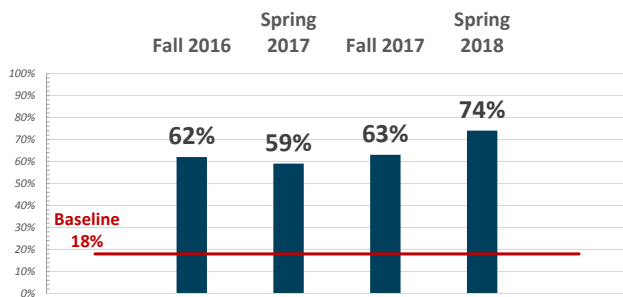


Percentages based on the number of developmental students completing a gateway course in one semester.  
Two-Year Baseline represents students enrolled in a dev. ed. course and then completed a gateway course in two years



Corequisite Success: KCTCS

Other Gen. Ed. Math in One Semester



Percentages based on the number of developmental students completing a gateway course in one semester.  
Two-Year Baseline represents students enrolled in a dev. ed. course and then completed a gateway course in two years



## Corequisite Education – What Works (June 2017)

- **Understanding best practices in implementing corequisite education**
- **Involving Faculty throughout implementation**
- **Communicating and providing professional development for administration, faculty, admission, advising, and tutoring staff**
- **Designing communications for students and families**
- **Coordinating at all levels**
- **Building strong student academic supports into corequisite courses**
- **Believing that your model makes a student success difference**
- **Evaluating of your corequisite model and making needed changes**



## Corequisite Education – What Works (January 2018)

- **Research-based models**
- **Strong institutional support**
- **Faculty and staff involvement throughout the implementation process**
- **Collaborative and continuous approach to program design, implementation, communication, review, assessment, and improvement: “Every voice counts.”**
- **Faculty “share” sessions: What works and what doesn’t work**
- **Embedded academic support learning model : “Just-in-time” supports**
- **Careful selection of faculty and staff teaching and supporting student learning**
- **Integrated instructional designs**
- **Faculty and staff research shared throughout the campus community at departmental meetings or research posters and publications**
- **Ongoing professional development by faculty and staff for faculty and staff: “not one and done PD”**
- **Create meaningful assignments and assessments for learning: “Teaching to promote learning”**



### **Corequisite Education – What Works (June 2018)**

- **Increased contact time with the instructor**
- **Small Class sizes**
- **Mentoring and training for full and part-time faculty**
- **Assigning professional advisors**
- **College ready and underprepared students together had a better success rate**



### **Corequisite Education – Your Words**

- **“The co-requisites are producing positive results in student success and retention. Faculty are witnessing students offering support and encouragement to their peers and creating study groups.”**
- **“One of the best features in our co-requisite coursework was imbedding the supplemental instruction, along with a tutor, in the gateway ENG101 course for writing and the RDG185 course that we are using for the reading co-requisite. It saves the student money, as well as making scheduling much easier. We are looking forward to seeing how the grades compare to those who did not need remediation.”**
- **“In the co-requisite English approach, one particular element which has proven to be very effective is the scheduling practice of combining about 15 students with “at benchmark” scores with about 10 students who scored at the co-requisite level. The higher level students were more engaged, more interested, more likely to complete homework and assignments on time, and more likely to be prepared for class. Due to this “immersion” practice, the co-requisite students observed and learned college success behaviors that they begin to adopt. “**



### **Corequisite Education – The Challenges (June 2017)**

- **Communication, communication, communication**
- **Coordination**
- **Ownership and belief of the model by all stakeholders**
- **Advising**
- **Designing and implementing the academic support system needed for student success at your institution**
- **Evaluation**
- **Changing, based on evidence of what works (and doesn't), when and where needed**



### **Corequisite Education – The Challenges (January 2018)**

- **Communication of the new developmental education program model**
- **Program coordination**
- **Ownership and belief of the model by all stakeholders**
- **Class scheduling**
- **Advising**
- **Evaluation**
- **Making needed program changes**





### **Corequisite Education – The Challenges (June 2018)**

- **Faculty load**
- **Students' lack of effort and non-attendance**
- **Student persistence**
- **Advising, placement, registration and enrollment/scheduling**



### **Corequisite Education – Your Words**

- **“One of the main challenges involves advising and registration/enrollment into the paired courses. Currently, the student information system (PeopleSoft) does not recognize the pairings due to needed programming.”**
- **“Students in a co-requisite class do not seem to have an internal expectation of success and thus will be easily discouraged and ready to give up.”**
- **“Since “normal” faculty teaching loads are 12 credits per semester, it is difficult to assign a five-credit hour course into that load.”**
- **“We are still facing a considerable persistence problem that appears financial more often than academic.”**



## Program Spotlights

- **SKYCTC, Dr. Tonya Daniels – English**
- **Kentucky State University, Dr. Fariba Bigdeli-Jahed & Karen Haevin – Mathematics**
- **WKCTC Tina Ragsdale, - Mathematics**



# SOUTHCENTRAL ENGLISH CO-REQUISITE

DR. TONYA F. DANIELS



**SOUTHCENTRAL  
KENTUCKY**  
COMMUNITY  
& TECHNICAL  
COLLEGE

## Co-requisite model

English

- ENG 100 is paired with ENG 101 in the co-requisite English model.
- The ENG 100 course is a 2 credit hour course capped at 24 students and the ENG 101 course is a 3 hour course capped at 24 students as well.
- The co-requisite ENG 100 course occurs 15 minutes before or after the paired 101 course and is taught by the same instructor.
- The course operates as a workshop model and uses a computer-based review program (such as MyWritingLab).



**SOUTHCENTRAL  
KENTUCKY**  
COMMUNITY  
& TECHNICAL  
COLLEGE

## Implementation

English

- Developed English and Math Charts for all faculty and staff
- Discussed the co-requisite changes at our mandatory semester Academic Affairs meetings
- Pilot instructor attended co-requisite training
- Piloted the course with one instructor the first semester
- Pilot instructor trained oncoming new instructors
- Additional F2F courses added
- Online course added



**SOUTHCENTRAL  
KENTUCKY**  
COMMUNITY  
& TECHNICAL  
COLLEGE

## SKYCTC Course Placement Chart

English sections

**ENGLISH PLACEMENT**

\* See back of chart for placement notes for Supplemental English Course Instructions.

ACT	SAT	GED	COMPASS	ASSET	KYOTE	TABE A	KCTCS Courses
18	430 Writing or 450 Critical Reading	165 Language Arts	74	43	6	12.8	ENG 101
14			39	38		9.6	ENC 091 or ENG 100/101
13 or below			38 or below	37 or below		9.5 or below	Refer to Adult Basic Education

	ACT	SAT	Compass	ASSET	KYOTE	TABE A	KCTCS Courses
English	14-17	n/a	39-73	38-42	n/a	9.6-12.7	ENC 091* ENG 100/101



## Obstacles

English

- Unable to hire qualified tutors for the program
  - TLC tutoring services
  - Imbedded librarians
  - Same course instructor
  
- Enrollment troubles with the co-req. model
  - Reminders via email and AA meetings
  - Placement of 'P' on co-requisite section numbers



## Co-Requisite Success!

English & Math

	Percentage of A's	Percentage of B's	Percentage of C's
ENG 101	28% (96 students)	27% (94 students)	18% (61 students)
ENG 101 with Co-requisite	38% (58 students)	25% (2 students)	15% (23 students)
MAT 146	13% (2 students)	13% (2 students)	33% (5 students)
MAT 146 with Co-requisite	22% (2 students)	22% (2 student)	44% (4 student)
MAT 150	25% (46 students)	21% (28 students)	24% (44 students)
MAT 150 with Co-requisite	15% (10 students)	42% (38 students)	16% (11 students)



**SOUTHCENTRAL  
KENTUCKY**  
COMMUNITY  
& TECHNICAL  
COLLEGE

THANK YOU  
QUESTIONS?



**SOUTHCENTRAL  
KENTUCKY**  
COMMUNITY  
& TECHNICAL  
COLLEGE

# Kentucky State University Corequisite Course Model

Dr. Fariba Bigdeli-Jahed  
Karen Heavin

## Fall 2017 – Spring 2018 Comparison

Course	Fall 2017	Spring 2018	Grade
MAT 101	72% ( 72/100)	71% (25/35)	ABC
MAT 111	88% (37/42) 95% (40/42)	60% (6/10) 80% (8/10)	ABC ABCD
MAT115A	71% (42/59)	80% (63/79)	ABC
MAT 115	57% (12/21)		ABC

## MAT 111 – Details

### Accelerated Contemporary Mathematics

- MAT 111 is a non-algebra based general education course for majors not requiring college algebra.
- There is no minimum ACT/SAT or prerequisite course requirement

## MAT 111 - Details

Course	Fall 2017 (No W)	Spring 2018	Grade
MAT 111	88% (37/42) 95% (40/42)	60% (6/10) 80% (8/10)	ABC ABCD

- Fall - passing ABC
  - 37 students ACT 12 – 18, 19, 20, 22, transfer
  - D – 3 students ACT 14 – 16
  - F – 2 students ACT 16

## MAT 111 - Details

Course	Fall 2017 (No W)	Spring 2018	Grade
MAT 111	88% (37/42) 95% (40/42)	60% (6/10) 80% (8/10)	ABC ABCD

- ▶ Spring – passing ABC
  - ▶ 37 students ACT 12 – 18, 19, 20, 22, transfer
  - ▶ D – 2 students ACT 15 – 16
  - ▶ F – 2 students ACT 15 – 16
- ▶ Passing rate differences were affected by small class size in the spring

## MAT 101 – Details Algebraic Concepts

- ▶ MAT 101 is a prerequisite for students with an ACT < 19 who need college algebra for their major.
- ▶ There is no minimum ACT/SAT or prerequisite course requirement.
- ▶ Limited range of content



## MAT 101 - Details

Course	Fall 2017 (No W)	Spring 2018	Grade
MAT 101	72% ( 72/100)	71% (25/35)	ABC

- Fall - Passing ABC
  - 61 students ACT 13 - 18
  - 2 students misplaced
  - 9 students transferred or had no recorded ACT
- Fall - not passing
  - 28 students ACT 13 - 18

## MAT 101 - Details

Course	Fall 2017 (No W)	Spring 2018	Grade
MAT 101	72% ( 72/100)	71% (25/35)	ABC

- Spring - passing with ABC
  - 24 students ACT 15 - 18
  - 1 student SAT 530 repeated MAT 115 × 2
- Spring - not passing
  - 10 students ACT 13 - 16

## MAT 115A – Details Accelerated College Algebra

- ▶ MAT 115A is an accelerated college algebra course for students who need college algebra for their major.
- ▶ Prerequisites are MAT 101 or MAT 096 or equivalent for transfer students

## MAT 115A - Details

Course	Fall 2017 (No W)	Spring 2018	Grade
MAT115A	71% (42/59)	80% (63/79)	ABC

- ▶ Fall - Passing ABC
  - ▶ 42 students ACT 15 - 24
    - ▶ 14 students previously passed MAT 101 ACT 14 - 18
    - ▶ 3 students previously passed a developmental course
    - ▶ 1 student attempted MAT 115 x 2

## MAT 115A - Details

Course	Fall 2017 (No W)	Spring 2018	Grade
MAT115A	71% (42/59)	80% (63/79)	ABC

- ▶ Fall – not passing
  - ▶ 17 students ACT 11 – 21
    - ▶ 3 previously passed MAT 101
    - ▶ 2 developmental math transfers
    - ▶ 12 students ACT 19 and above

## MAT 115A - Details

Course	Fall 2017 (No W)	Spring 2018	Grade
MAT115A	71% (42/59)	80% (63/79)	ABC

- ▶ Spring - Passing ABC
  - ▶ 63 students ACT 15 - 25
    - ▶ 34 students previously passed MAT 101 ACT 15 – 18
    - ▶ 5 students ACT 16 - 17
      - ▶ Transfer students, MAT 096
    - ▶ 24 students ACT 20 - 25

### MAT 115A - Details

Course	Fall 2017 (No W)	Spring 2018	Grade
MAT115A	71% (42/59)	80% (63/79)	ABC

- ▶ Spring – not passing
  - ▶ 16 students ACT 15 – 24
    - ▶ 9 previously passed MAT 101 ACT 16 – 18
    - ▶ 2 developmental math transfers (096/097)
    - ▶ 5 attempted college algebra 2 or more times (ACT > 21)

### Sequential Course results Fall, Spring and Fall to Spring

Fall	Spring	Success Rate
MAT 115A (59)		71% (42/59)
Second attempt	MAT 115A (2)	100% (2/2)
	MAT 115A (79)	80% (63/79)
<b>MAT 101</b>	<b>MAT 115A (39)</b>	<b>77% (30/39)</b>

## Sequential Course results: Fall, Spring and Fall to Spring

Fall	Spring	Success Rate
	MAT 115A (79)	80% (63/79)
<b>MAT 101</b>	<b>MAT 115A (39)</b>	<b>77% (30/39)</b>

- More than ½ of the spring MAT 115A enrollment were progressing MAT 101 students
- Approximately ½ of the students passing MAT 115A in the spring were MAT 101 students
- Fall 14/17 MAT 101 passed

## Comparing success

- There is a significant difference ( $p < .0001$ ) in mean ACT math subscore between students who passed MAT 115A having taken MAT 101 and students who had not taken MAT 101.
- Higher passing rates and fewer student retaking a math courses.
- High success rate for progressing MAT 101 students

## MAT 115A, MAT 111 and MAT 101 Restructuring and Refocusing

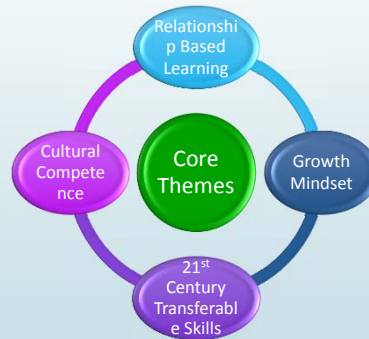
### Why the choice to refocus

- A student's inability to grasp mathematics is not driven by content or intelligence.
  - See the same material 2 to 3 times in high school
  - Highly successful people cannot pass math
- Critical thinking and problem solving should live in mathematics
- Our previous scope and sequence was based on information delivery and could be easily simulated.
- Emphasize depth of understanding instead of breadth of content

## MAT 115A and MAT 101 Restructuring and Refocusing

- Response
  - Inquiry based learning and student exploration were emphasized
  - Professional development (Opportunity Access Network, CC training)
  - Teaching through error analysis\*\*
  - Department designed workbook with collaboration
  - Each classroom has an instructional counselor
  - Embedded non-math content through out the course
    - Mindset Development
    - Relationship based learning
    - Culturally competent instruction
    - 21<sup>st</sup> Century Transferable Skills

## Core Themes



## Growth Mindset Development

- ▶ Purposely creating a “safe” learning environment
- ▶ Productive struggle – growth can be uncomfortable\*\*
- ▶ Teaching students to persist through failure and frustration requires planning and intentionality
- ▶ FAIL – First Attempt in Learning
- ▶ Addressing student fear of math
- ▶ Mental models – brain science and neuroplasticity
- ▶ Setting the example of taking risk
- ▶ Students present and teach\*\*
- ▶ Develop independent learning and problem solving



## Relationship Based Learning Culturally Competent Instruction

- ▶ All classrooms have a culture created by the teacher and the students
- ▶ Students work together instead of compete. Build a community of learners \*\*
- ▶ The relationship between the instructor and student is reciprocal
- ▶ Learning is a socio and emotional activity
- ▶ Support students while keeping expectations high – mastery learning



## Relationship Based Learning Culturally Competent Instruction

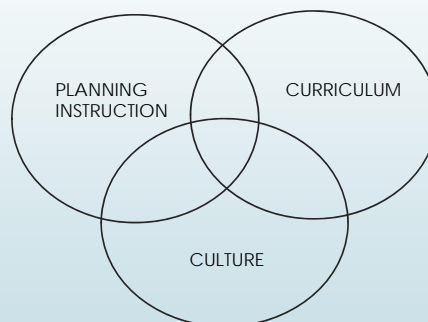
- ▶ Multiple approaches to content\*\*
- ▶ Culture connections – collective learning vs independent learning
- ▶ Students connect content to their life/world experiences\*\*
- ▶ Debate properties and points of view
- ▶ Help students relearn how to learn in a classroom
- ▶ Focus on what makes them different from a robot
  - Non-automated human strengths



## 21<sup>st</sup> Century Transferable Skills\*\*

- These skills should live in a math classroom.
  - Critical thinking
  - Creativity
  - Problem Solving
  - Collaboration
  - Leadership

## Practices of the Most Successful Schools



## Course Content

- ▶ MAT 111 project based
- ▶ MAT 115A – Factoring through exponential and logarithmic functions
- ▶ MAT 101 – Rate of change, linear equations, graphing, factoring
  - ▶ Student workbook
  - ▶ IBL
  - ▶ Skill and concept exams
  - ▶ Mastery learning
  - ▶ Presentations – teaching by students to students
  - ▶ Group work

## Implementation Groans and Glows

- ▶ Implementation was/is difficult
  - ▶ Creating a workbook
  - ▶ Balancing inquiry with algorithm and process
  - ▶ Growth mindset required by faculty
  - ▶ Still tweaking and modifying
  - ▶ Instructional Counselor availability and support
- ▶ Statistics support the restructure
  - ▶ MAT 115 and MAT 111 success
  - ▶ MAT 101 → MAT 115A success

## *Co-requisite College Algebra*

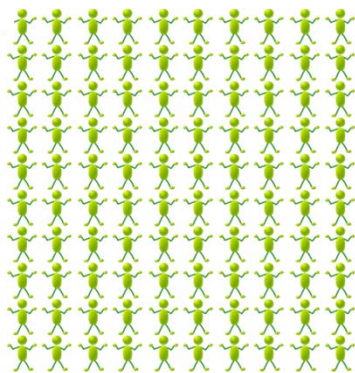
Tina Ragsdale  
West Kentucky Community and Technical College

### **James Graham Brown Grant Report**

September 26, 2018  
Council of Post-Secondary Education  
Frankfort, KY



**WEST KENTUCKY**  
COMMUNITY  
& TECHNICAL  
**COLLEGE**



95% of  
the students  
never made it to  
College Algebra



**WEST KENTUCKY**  
COMMUNITY  
& TECHNICAL  
**COLLEGE**

## College Algebra (MAT 150)

### TRADITIONAL

#### - 3 Credit Hours

- ACT  $\geq 22$
- Developmental students required to complete
  - MAT 55 – Pre-Algebra
  - MAT 65 – Basic Algebra
  - MAT 85 – Intermediate Algebra
- 2 Days a week (1 hour 15 minutes per day)



**WEST KENTUCKY**  
COMMUNITY  
& TECHNICAL  
**COLLEGE**

## College Algebra (MAT 150) - 3 Credit Hours

### CO-REQUISITE

#### Plus Co-requisite – Workshop (MAT 100) – 2 Credit Hours

- ACT  $\geq 19$
- Developmental students –
  - MAT 55 – Pre-Algebra
  - MAT 65 – Basic Algebra (Might skip MAT 85 by retesting at this point)
  - MAT 85 – Intermediate Algebra
- 4 Days a Week
  - College Algebra - 40 minutes a day
  - Workshop - 25 minutes per day (Paired with College Algebra)



**WEST KENTUCKY**  
COMMUNITY  
& TECHNICAL  
**COLLEGE**

**College Algebra (MAT 150) - 3 Credit Hours      CO-REQUISITE**  
**Plus Co-requisite – Workshop (MAT 100) – 2 Credit Hours**

- ACT  $\geq 19$
- Developmental students –
  - ~~MAT 55 – Pre-Algebra~~
  - MAT 65 – Basic Algebra (Might skip MAT 85 by retesting at this point)
  - MAT 85 – Intermediate Algebra
- 4 Days a Week
  - College Algebra - 40 minutes a day
  - Workshop - 25 minutes per day (Paired with College Algebra)



**EXPANDED BAND CO-REQUISITE**  
**College Algebra (MAT 150) - 3 Credit Hours**  
**Plus Co-requisite – Workshop (MAT 100) – 2 Credit Hours**

- ACT  $\geq 17$
- Developmental students required to complete
  - ~~MAT 55 – Pre-Algebra~~
  - MAT 65 – Basic Algebra
- 4 Days a Week
  - College Algebra - 40 minutes a day
  - Workshop - 25 minutes per day (Paired with College Algebra)



**College Algebra (MAT 150)**

**- 3 Credit Hours**

**ACCELERATE YOU! (AY!)**

**Plus Co-requisite – Workshop (MAT 100) – 2 Credit Hours**

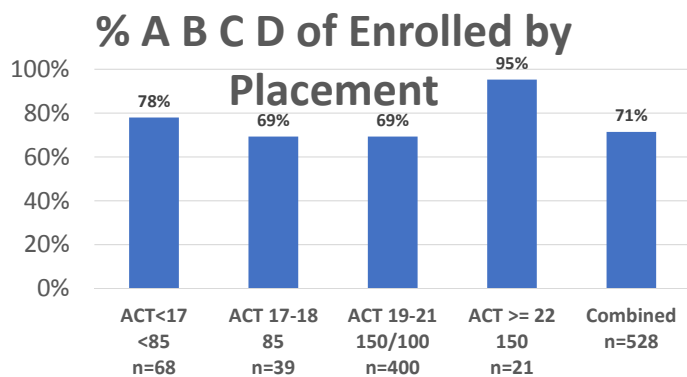
**Plus 1 hour supplement per week with Success Coach**

**ACT  $\geq 17$**

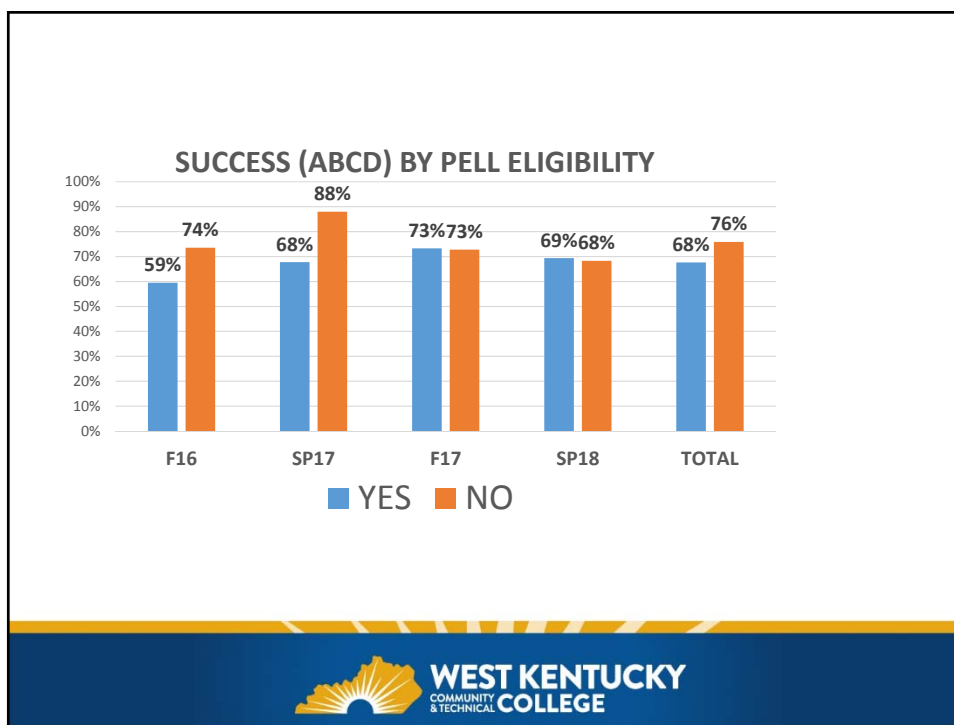
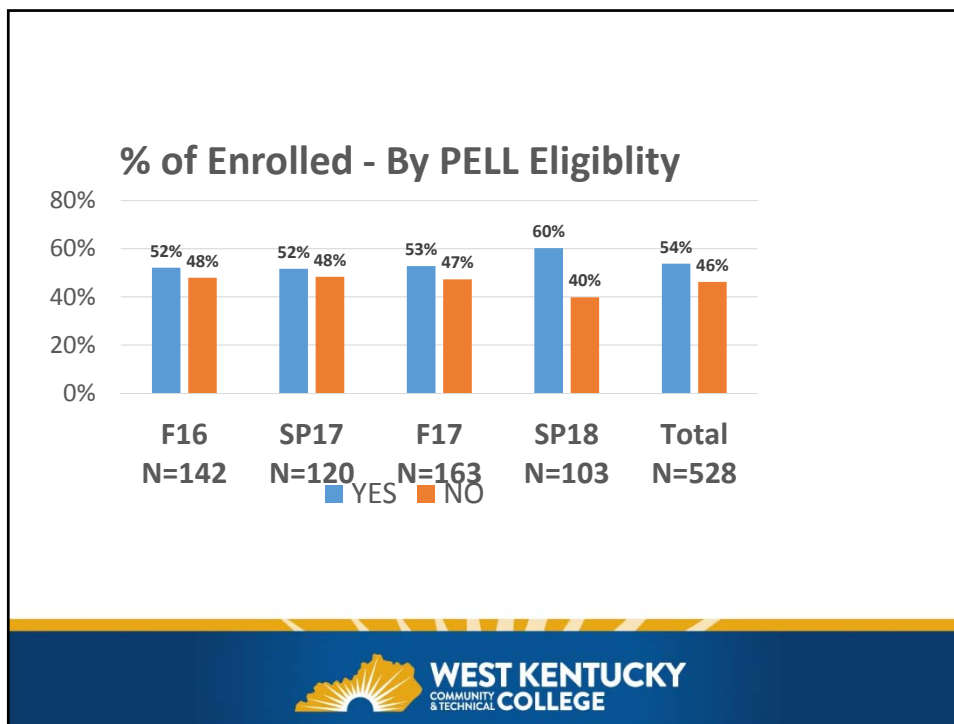
- Developmental students required to complete MAT 65 – Basic Algebra
- 4 Days a Week
  - College Algebra - 40 minutes a day -Workshop - 25 minutes per day (Paired)
- Success Coach attends class 2 hours per week

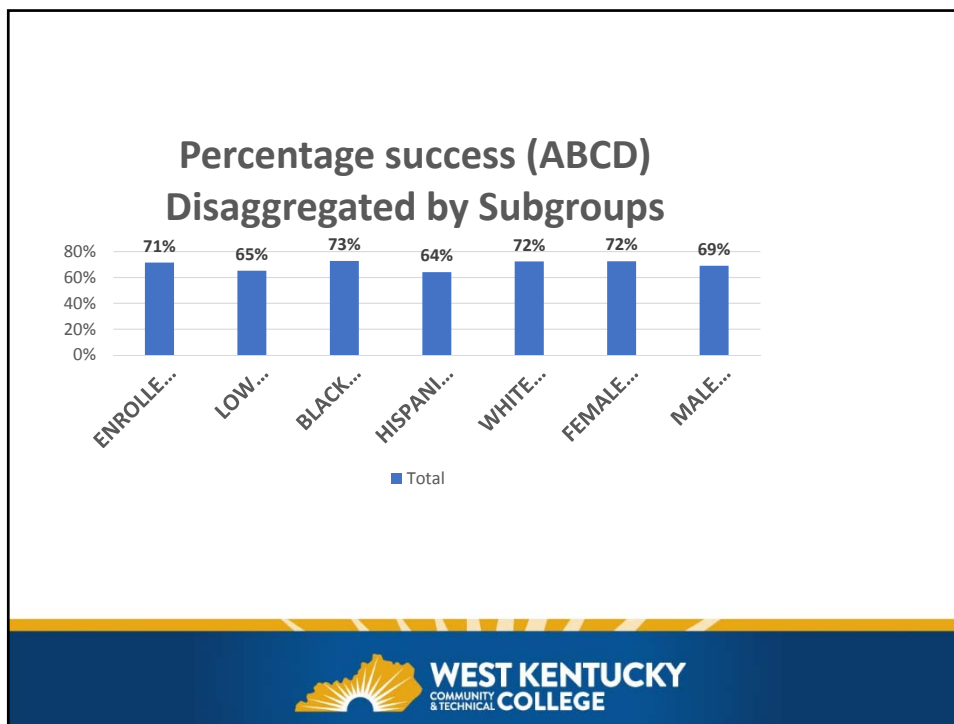


**WEST KENTUCKY**  
COMMUNITY & TECHNICAL COLLEGE



**WEST KENTUCKY**  
COMMUNITY & TECHNICAL COLLEGE





## QUESTIONS?

## THANK YOU!

For additional information:

**Tina Ragsdale**  
 Developmental Math Coordinator  
 Associate Professor Mathematics  
[Tina.Ragsdale@kctcs.edu](mailto:Tina.Ragsdale@kctcs.edu)  
 270-534-3352





## Implementation Groans and Glows

- ▶ Statistics support the success of restructure
  - ▶ MAT 115 and MAT 111 success rates
  - ▶ MAT 101 → MAT 115A success rates
- ▶ Non-cognitive research
  - ▶ Students feel the content is important
  - ▶ Results showed an increase in mastery learning focus and persistence

## Brainstorming Solutions





**STRONGER**  
by degrees

## Group Discussion

Kentucky Council on  
Postsecondary Education