MARS:
A Giant LEAP for Student Success

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OVERVIEW

• Describe IRSC’s QEP: MARS (Math At the Root of Success)
• Discuss the process
• Explain the cycle of action research
• Define the different course pedagogies
• Identify additional aspects of MARS
• Share DATA
• Discuss the possibilities for action research for YOUR institution
• Questions
**SACSCOC Quality Enhancement Plan**

**Identify the Problem**
Students’ failure to progress through introductory math courses

**Develop Plan of Action**
Improve student learning and success through redesign of introductory math courses

**Implement Plan & Assess Results**

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**College-wide involvement in IRSC’s QEP**

- The **college** and **community** provided input to select a topic for the QEP
- **Development team** (with members from throughout the college) did the research to narrow down the topic
- Once the topic was identified – needed **four action teams**
  - A total of **over 60 people** involved
    - Research & Implementation
    - Marketing & Design
    - Assessment & Evaluation
    - Curriculum & Leadership
Driving beliefs going forward

- IRSC’s #1 priority – authentic student learning & success
- It’s all about our students
- Focus on IMPROVING STUDENT LEARNING
- Potential impact – thousands of students expected to profoundly influence completion agenda

Curriculum Team

*Consisted of math department faculty*

Played a crucial role in implementation:
- Revise and **standardize** courses
- Maintain course **integrity** throughout redesign
- Respond to **quantitative** and **qualitative** data to make ongoing improvements
ACTION RESEARCH
Identify Problem

Data Collection
Research
Action
Evaluate Change
Research
Action
Evaluate Change
Data Collection
TYPES of DATA COLLECTED

QUANTITATIVE – 3 DATA POINTS
1. Diagnostic Exam
2. Departmental Final Exam
3. Final Grade In Course

QUALITATIVE – FOCUS GROUPS
1. Students  2. Tutors  3. Instructors

Initial Actions

➢ STANDARDIZED curriculum & content schedule

➢ Built one MARS (Math At the Root of Success) LAB (computer lab) on each of 2 campuses (now 16 labs on 5 campuses)

➢ Added new deliveries (EMPORIUMS)
COURSES & DELIVERY METHODS

2012-2013 (baseline year)
One course & Two delivery methods

2018-2019
Two courses & Eight delivery methods

2 INTRODUCTORY MATH COURSES

MAT1033 Intermediate Algebra
& MAT1100 Quantitative Reasoning
...The Results...

- Tremendous collaboration and teamwork in the math department; evidence-based decision making is the norm

- Dramatic improvement in introductory math courses

**BASELINE SUCCESS (2012–2013) 56%**

**COURSE SUCCESS (2018–2019) 74%**

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**ALL MAT1033 & 1100 SECTIONS**

- Take a **DIAGNOSTIC** at the start of the term (1033 - MML) (1100 – ALEKS)

- Have **STANDARDIZED CURRICULUM**
  Same online HW (in the same order) (1033 - MML) (1100 – ALEKS & EXCEL)

- Take a **COMMON departmental final exam**
DIFFERENT DELIVERIES

MAT1033 (Intermediate Algebra)
- SE – Supplemental Emporium (SE2 & SE4)
- HY – Hybrid Emporium
- FE – Flipped Emporium
- VM – Virtual Mastery
- TR – Traditional Face-to-Face

MAT1100 (Quantitative Reasoning)
- CL – Collaborative Learning in face-to-face classes
- QRO – Quantitative Reasoning Online

COLLABORATIVE LEARNING

MAT1100 – Quantitative Reasoning
**MAT1100**

- Developed for the LIBERAL ARTS PATHWAY as a pre-requisite for the liberal arts math courses
- Course Delivery for face-to-face sections Collaborative learning
- Curriculum includes employability skills: critical thinking, data analysis, employability skills (EXCEL - portfolios); increase math self-efficacy
- No pre-requisite – not for dual enrollment

**IRSC MATH EMPORIUMS**

*MAT1033 – Intermediate Algebra*
ALL IRSC EMPORIUMS...

- Take place in the MARS (computer) LAB

- Have both active learning & computer time

- Have an instructor and a tutor present during class time – “just in time” assistance

- Have testing on the computer with mandatory exam booklets to show work

SUPPLEMENTAL EMPORIUM

- Meets 4 hours a week – EXTRA CONTACT TIME

- Half of the time in active learning; other half in computer assignments

- Have two different schedules: SE2 & SE4

- SE2 – two hours twice a week

- SE4 – 1 hour four times a week

- SE is the delivery with the highest success rates for certain ethnic/socioeconomic groups
**HYBRID EMPORIUM (HY)**

- Meets 2.5 hours a week
- Hybrid - a combination of traditional and emporium pedagogies
- Most of the time in active learning with “some” time set aside for computer work with the instructor & tutor present
- Night and day classes – keeping night

**FLIPPED EMPORIUM (FE)**

- Meets 2.5 hours a week
- Typical FLIP pedagogy
- Student watches video before class
- Student are required to perform a task for each lesson known as WSQ (Watch, Summary, and Question).
- Instructor answers questions about assignment
- Students progress through computer assignment with instructor and tutor available
- **Subsequent course success rate**
  
  (2017 – 2018) **82%**
**VIRTUAL MASTERY (VM)**

- Online version of MAT1033
- **Baseline** success rate (2012–2013) 32%
- Success rate for (2018 – 2019) 59%
- Mastery based progression through the software using pre-requisites
- **Subsequent** course success rate: 80%

**IMPORTANT CONTRIBUTING FACTORS TO THE PROJECT:**

- Tutors
- Professional development
- **Mathematics department environment & communication**
**TUTORS – ASC & PEER**

- There is a tutor in **EVERY EMPORIUM CLASS**
- Tutors are a familiar face in the ASC tutoring lab
- Tutors conduct review sessions
- Peer tutors “look like” the students
- Tutors are making a difference
- There are tutor training sessions
- Majority of tutors are peer tutors
- **SCALE OUT** – Plans to develop a Peer Tutoring Program & expand to other departments

**FACULTY PROFESSIONAL DEVELOPMENT**

- **External:**
  - Study skills
  - Software training
  - Collaborative learning
  - Conferences

- **Internal:**
  - Professional Learning Communities (PLC)
  - Equity and inclusion
  - Active learning strategies (clickers & Echo360)
  - Engaging the Under-resourced College Student
Math Department Professional Development

Math Department Environment & Communication

➤ Genuine commitment to student learning and success
➤ Consistent sharing of what works & doesn’t
➤ Free-ranging discussion for possible solutions
➤ Examining data before making decisions
➤ Encouragement of new ideas and strategies
➤ Failures chalked up to experience and lessons learned
THE DATA:

Qualitative & Quantitative
QUALITATIVE DATA - FOCUS GROUPS

Students – Tutors - Instructors

Action taken every term

For example:

- Open MARS lab
- Test reviews in the software
- Test review days
- Alternative Emporium schedule
- Information flyers about courses and delivery methods
- Length of the assignments

SCALE OUT - FOCUS GROUP WORKGROUP

QUANTITATIVE DATA
Enrollment & Student Services’ Efforts
(in response to SB1720)

“NOT READY”
for gateway (introductory) math

Students had **13-18% LOWER**
success than students identified as READY

**SUBSEQUENT MATH COURSES**

2012 – 2013 (baseline)
72% success rate

2017 – 2018 (to date)
72% success rate
MAT1033 (2018-2019)

<table>
<thead>
<tr>
<th>Total Weekly Meeting Time</th>
<th>Course Success</th>
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<tbody>
<tr>
<td>2.5 HRS (Traditional; FE; HY)</td>
<td>64% TR</td>
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<tr>
<td></td>
<td>63% FE-HY</td>
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<tr>
<td>4 HRS (SE2; SE4)</td>
<td>69%</td>
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DISCUSSION

- Action Research
- Focus Groups
- Peer Tutoring

What subject areas/courses could each or any of these things help improve student success in YOUR QEP or at your institution in general?
THE MARS DATA REINFORCES WHAT WORKS FOR SUCCESS

- Action-Research
- Guided Pathways
- STANDARDIZATION across the department (curriculum, diagnostic testing, departmental finals)
- EXTRA student/teacher contact time
- Emporium deliveries
- Tutors & peer tutors
- Collaborative learning
- Focus groups for meaningful change
- Opportunities to share through PROFESSIONAL DEV.
- Scaling out to other courses & disciplines

QUESTIONS?

INDIAN RIVER STATE COLLEGE