Using Action Research for Student Success Within SB1720

AFC Teaching & Learning - April, 2019 in St. Pete

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*"**Math courses** are the most significant*

barrier** to degree **completion

*in **both STEM** and **non-STEM** fields"*

(Saxe,K. & Braddy, L., p.p. 28, 2015)

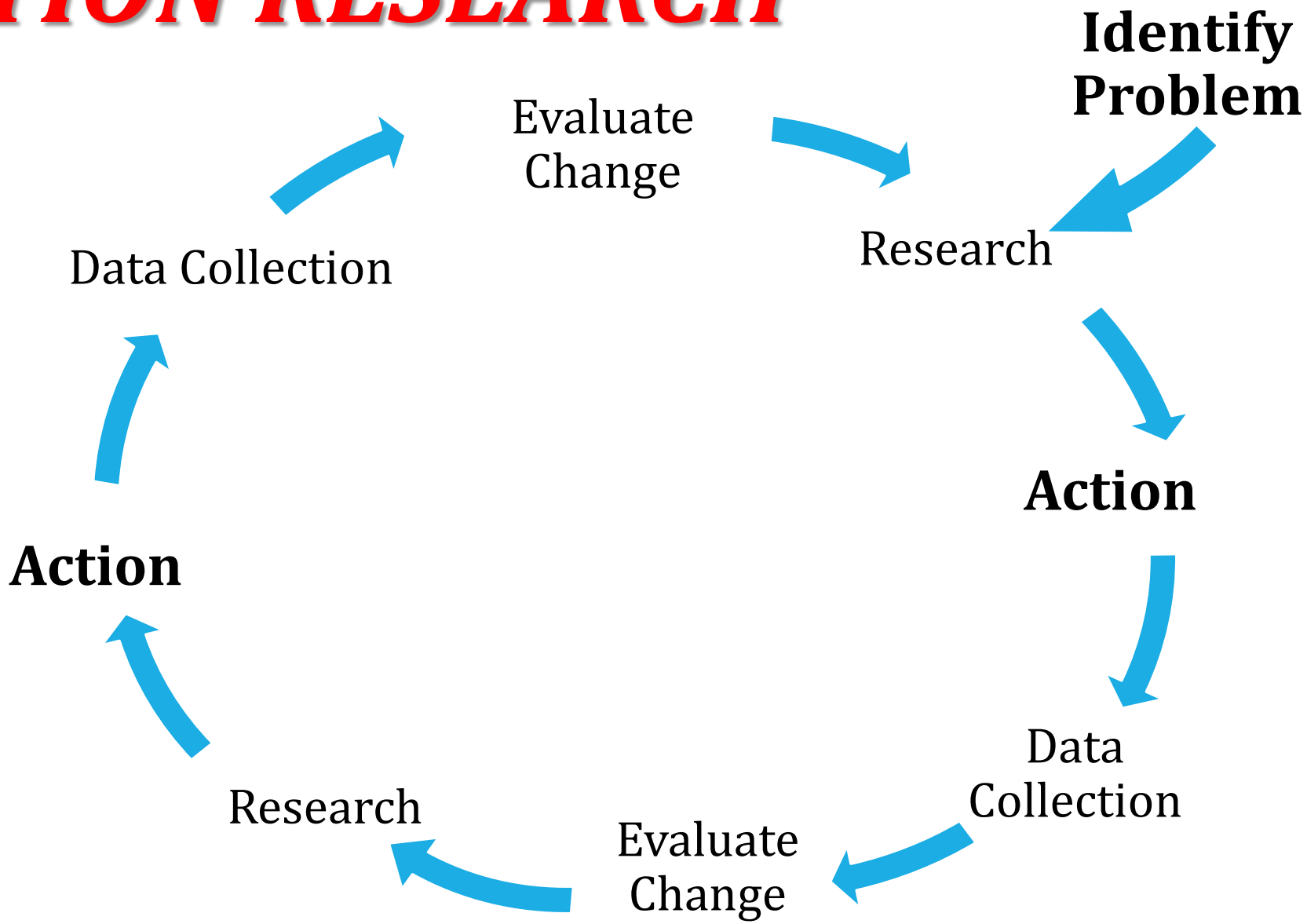
COMMON VISION - MAA

Overview

1. The steps/cycle of Action Research
2. The MARS Project
3. Course pedagogies
4. Additional aspects of MARS
5. Discussion of the possibilities for Action Research for **YOUR** institution
6. DATA
7. Questions


Action
research
practice
Questions
process
understanding
actions
researcher
researchers
change
one's
inquiry
multiple
deep
one
develop
reflective
taken
evidence
theory
good
work
working
learning
effective
look
seek
practices
help
less
way
forces
reflection
question
perspectives
improvement
stakeholders
community
systematic
reflecting
cycle
taking
progressive
expertise
personal
towards
others
improve
professional
values
possible
often
Developing
improved
affect
heart
social
form
effects
Goals
helps
better
examples
shape
ways
new
Guide

ACTION RESEARCH



Developing Action Research

1. ***IDENTIFY THE PROBLEM:***

Students' failure to progress through gateway (introductory) math courses

2. ***SELECT THE RESEARCH PROJECT:***

Improve student learning and success in gateway (introductory) math courses

3. ***COLLECT THE DATA***

Two types of data was collected every term

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

- **STANDARDIZE** curriculum & content schedule

- Build **MARS** (Math At the Root of Success) **LABS** on 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

TWO INTRODUCTORY MATH COURSES
MAT1033 & MAT1100

BASELINE (2012–2013) - 54.8%

2017 – 2018 - - 67.4%

This is an increase of 23.0%

12.6 percentage points

ALL MAT1033 & 1100 SECTIONS

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

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

- Take a **common departmental final** exam

DIFFERENT DELIVERIES

MAT1033

SE – Supplemental Emporium (SE2 & SE4)

VM – Virtual Mastery

FE – Flipped Emporium

HY – Hybrid Emporium

TR – Traditional Face-to-Face

MAT1100

CL – Collaborative Learning in face to face classes

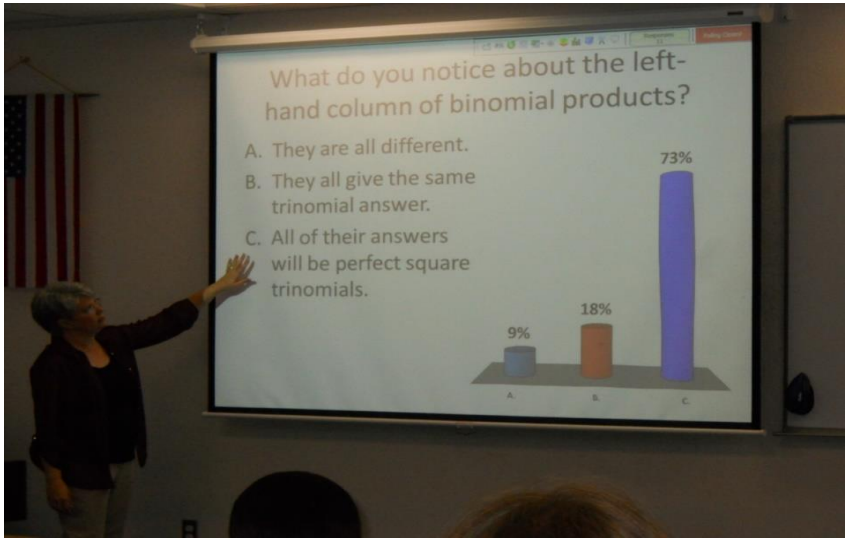
QRO – Quantitative Reasoning Online

IRSC COLLABORATIVE LEARNING

MAT1100 – Quantitative Reasoning

- 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 **"soft" skills**: critical thinking, data analysis, employability skills (EXCEL - portfolios); increase math self-efficacy
- **No pre-requisite – not for dual enrollment**
- Course **success rates** for 2017-18: **77%**

IRSC MATH EMPORIUMS



Characteristics of ALL IRSC EMPORIUMS

- Takes place in the **MARS LAB** (computer lab)
- Have **both** active learning and 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**. (Except for final exam which is hard copy)
- Have two different timeframes - some emporiums meet **4** hrs a week & all the other emporiums meet **2.5** hrs a week

SUPPLEMENTAL EMPORIUM SE2 & SE4 (MAT1033 & MAC 1105)

- Meets 4 hours a week – **EXTRA CONTACT TIME**
- Half of the time in active learning – other half in MML 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 for "just in time" assistance
- 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 for "just in time" help
- **Subsequent** course success rate (2017 – 2018) **82.3%**

VIRTUAL MASTERY - VM

- Online version of MAT1033
- **Baseline** success rate (2012–2013) **31.6%**
- Success rates for (2017 – 2018) **55.1%**
- Mastery based progression through the software using pre-requisites
- **Subsequent** course success rate:**79.8%**

OTHER 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 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 concern for student learning and success
- Consistent sharing of what works & doesn't
- Free discussion for possible solutions
- Requiring (needing) data before making decisions
- Atmosphere of fearless attempts at new ideas
- Failure of an attempt chalked up to experience and lessons learned

DISCUSSION

Action Research

Focus Groups

Peer Tutoring

What subject areas/courses could each of these things help improve student success at YOUR institution?

THE DATA:

Qualitative & Quantitative


Motivators
Understand
Experience
testing
Barriers
Qualitative
Advertising
moderation
partnership
feedback
Quality
Strategic
Insights
Explore
groups
Instant
Strategy
Newfocus
Challenging
Interviews
group
ideas
Dive
Process
Implementation
Importance
Appeal
research
techniques
insights
Focus
Ethnography
Dynamic
Observations
Projective
Options
exploration
Concept
Innovative
Debate

QUALITATIVE DATA - FOCUS GROUPS

Three groups: **students – tutors – instructors**

Action taken every term:

- 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 of Focus Groups Throughout The College

Focus Group Workgroup

QUANTITATIVE DATA

MAT1033 for FTIC - Fall 2017

Total Weekly Meeting Time	Course success
2.5 HRS (Traditional; FE; HY)	60.5%
4 HRS (SE2; SE4) MORE TIME	69.0%

MAT1033 (2017- 2018)

Total Weekly Meeting Time	Course success
2.5 HRS (Traditional; FE; HY)	**63.0%**
4 HRS (SE2; SE4) **MORE TIME**	**68.1%**

SUCCESS BASELINE TO (2017-2018)

Race/Ethnicity	(2012 – 2013)	(2017-2018)
Black	48.4%	57.8%
Hispanic	51.7%	69.9%
Other	65.6%	69.8%
White	57.0%	70.1%
Total	54.8%	67.4%

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)

72.5% success rate

2016 – 2017 (to date)

73.6% success rate

THE QEP DATA REINFORCES WHAT WORKS TO BE SUCCESSFUL AT IRSC

- **Collaborative learning**
- **Focus groups** for meaningful change
- **Tutors** & **peer tutors** in the classroom
- **EXTRA student/teacher contact time**

- **STANDARDIZATION** across the department (curriculum, diagnostic testing, departmental finals)
- **Emporium delivery**
- **Active learning strategies**
- **Guided Pathways**
- **Scaling out** to other courses & disciplines (Biology, Chemistry, College Algebra, Accounting)
- **Opportunities** to share through **PROFESSIONAL DEV.**


Quality Enhancement Plan
Mathematics
The Root of Success
Indian River State College

QUESTIONS?