Lessons Learned:
Assessing Your Students & Your Corequisite Program

Cowley College – working on clear expectations

★ Complete appropriate gateway Math (and English) in the first year

★ Advise to a program/pathway, reducing rates of "undeclared"

★ Clear communication with high school stakeholders

★ Make sure to not divert from STEM based on placement score differentials

★ Engage in continuous improvement through continuous inspection of data

Lessons Learned:
Assessing Your Students & Your Corequisite Program

Developing & Assessing Student Understanding

★ Examine ways to engage all students where they are and move them forward.

★ Explore culturally responsive teaching strategies that motivate learning.

★ Consider concrete strategies that support students in taking charge of their own learning.

Preparing to Assess Your Corequisite Program

★ Collecting and analyzing aggregate and disaggregated data.

★ Explore incorporating student voice into the improvement process.

Leading with an equity-driven focus

Clarifying Our Pursuit for Equity

Clarifying Our Pursuit for Equity

Within this same picture, a **DIVERSITY** lens focuses only on bringing more students into an unequal pathway.

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In contrast, **EQUITY** redirects resources to the pathways with greatest need to fix barriers and intentionally provide support.

Regular data disaggregation & analysis

Goal setting and action planning

Faculty & staff training to be equity facilitators

Inquiry to understand how practices impede equity

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Definition of Equity…

…ensuring **equally high outcomes for all**, removing the predictability of success or failures that currently correlates with any social or cultural factor, examining biases, and creating inclusive environments.

➢ Equity in **access**

➢ Equity in **learning**

➢ Equity in **success**

Definition of Equity-Mindedness...

...refers to the perspective of thinking demonstrated by practitioners who call attention to patterns of inequity in student outcomes.

Practitioners are willing to take personal and institutional responsibility for the success of their students, and critically reassess their own practices. It also requires that practitioners are race-conscious and aware of the social and historical context of exclusionary practices in American higher education.
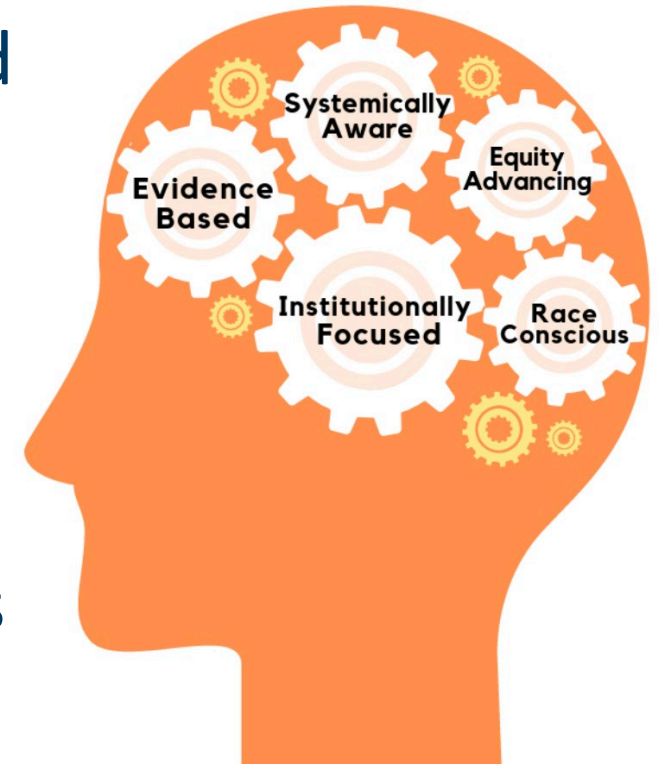
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Developing and Assessing Student Understanding

Cowley College – working on clear expectations

★ Classroom level expectations:

- ★ Participate in department collaborations and professional learning

- ★ Design your courses and then embed support just-in-time

- ★ Engage in continuous formative assessment of student progress

Regular Formative Assessment to inform just-in-time support

Examples

- Checking the homework system right before class for commonly missed problems.

- Class openers that check for understanding.

- Clicker-type problems.

- Exit tickets that ask for new understandings or muddiest points.

Clicker-type questions

Basic example

Which of the following shows a pair of like terms?

$1)\ 3x^2$ and $3x$

$2)\ 3x^2$ and $4x^2$

$3)\ 3x^2$ and 3

$4)\ 3x^2$ and $2x^3$

Example: Concept Checks

How are they implemented?

- Establish the rules for participation

- Ask students to vote

- Discuss and make a case

- Revote and discuss

Example: Concept Checks

Basic example

Which of the following shows a pair of like terms?

$1)\ 3x^2$ and $3x$

$2)\ 3x^2$ and $4x^2$

$3)\ 3x^2$ and 3

$4)\ 3x^2$ and $2x^3$

Example: Concept Checks

Level-up modification

Which of the following shows a pair of like terms?

1) $3x^2$ and $3x$

2) $3x^2$ and $4x^2$

3) $3x^2$ and 3

4) $3x^2$ and $2x^3$

5) None of the above

Alice, Bob, and Cindy are asked to evaluate $\sqrt{16}$. Alice says the answer is 4, Bob says it is -4, and Cindy says they are both correct. Who is right?

1) Alice

2) Bob

3) Cindy

Level-up modification: True/False with confidence

All quadratic functions have at least one x-intercept.

    1) True, and I am very confident

    2) True, but I am not very confident

    3) False, but I am not very confident

    4) False and I am very confident

Example: Concept Checks

How do you create them?

- Use and/or modify multiple choice questions from the book.

- Pick wrong answers that correspond to common misconceptions.

- Voting question libraries for math classes are available at: http://mathquest.carroll.edu/

Dana Center Curriculum Design Standards

For today's purposes, consider the Assessment section

Introducing Culturally Responsive Teaching Practices

Culturally Responsive Teaching

Cultural Frameworks

Individuated ---------------------- *Integrated*

In a culturally **INDIVIDUATED** worldview or epistemology, a private compartmentalized, individualized, contextually independent conception of the world is common, assumed, and valued.

In a culturally **INTEGRATED** worldview or epistemology, an interconnected, mutual, reflective, contextually dependent conception of the world is common, assumed, and valued
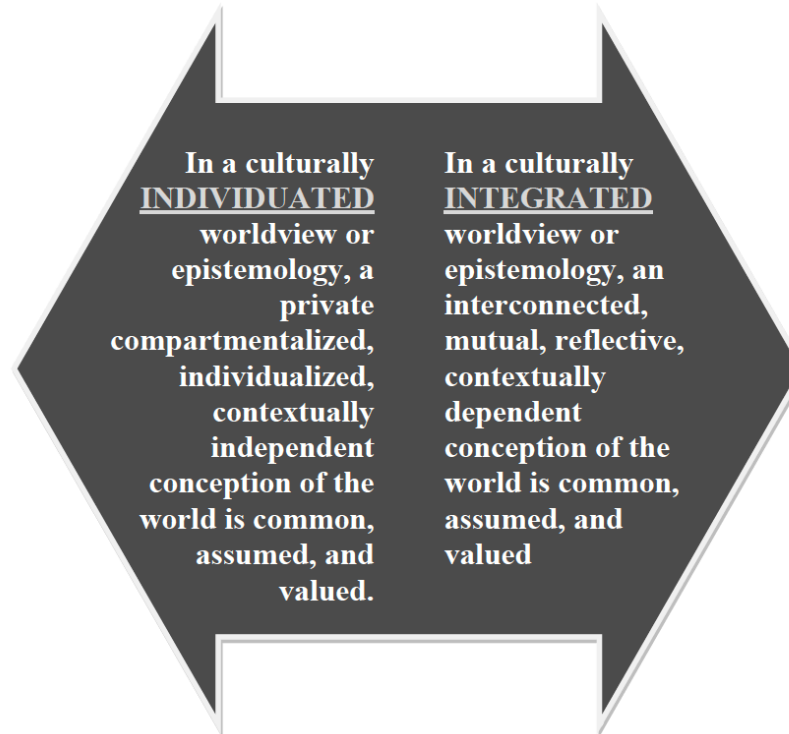
Developed by Alicia Fedelina Chávez for Ke & Chávez, *Web Based Teaching and Learning across Culture and Age.* Springer, 2013.

Chavez & Longerbeam (2016)

Cultural Frameworks in Teaching and Learning

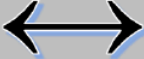| Individuated		Integrated
In a culturally <u>individuated</u> framework, a private compartmentalized, linear, contextually independent conception of the world is common, assumed, and valued.	$\longleftrightarrow$	In a culturally <u>integrated</u> framework, an interconnected, mutual, reflective cyclical, contextually dependent conception of the world is common, assumed, and valued
Knowledge, individual competence, to move forward toward goals and the betterment of humanity	**Purpose of Learning**	Wisdom, betterment of the lives of those with whom we are connected - family, tribe, and community
Mind as primary, best, or only funnel of knowledge	**Ways of Taking in and Processing Knowledge**	Mind, Body, Spirit/Intuition, Reflection, Emotions, Relationships as important aspects and conduits of knowledge
Compartmentalized and separate; belief that understanding how the parts work separately, abstractly, and in isolation will lead to the greatest understanding	**Interconnectedness of What is Being Learned**	Contextualized and connected, belief that understanding how things affect each other within the whole, and within family and community will facilitate understanding
Learning is a private, individual activity; responsible for one's own learning so that family and others are not burdened	**Responsibility for Learning**	Learning is a collective, shared activity, Responsible for one's own as well as others' learning
Linear, task oriented, can be measured and used, to be on time shows respect	**Time**	Circular, seasonal, process oriented, dependent on relationships, to allow for enough time shows respect
Provider and Evaluator of Knowledge -- best perspectives and ways of learning, predetermined bounded learning; communication primarily between teacher and students	**Role of the Teacher, Control**	Facilitator of Learning Experiences -- multiple perspectives and ways of learning, emergent constructivist; wide variety of interactions between students, and between teacher and students
Others' perspectives are optional for learning. Primarily rely on verbal messages; individuals are paramount, predominantly verbal in both written and oral communications	**Student Interactions**	Others' perspectives and interpretations are important, even essential to learning. High use of nonverbals, collective as paramount, and multiple streams of communication
Learning by mastering abstract theory first, followed by testing. Unlikely to include application, experience, or doing in real life	**Sequencing**	Learning by doing, listening to others' experiences, imagining or experiencing first, then drawing out abstract theory

Chávez & Longerbeam (Stylus, 2016). The earliest version of this model was presented in a paper at the 2009 ASHE Conference and we then developed this model from a later version of in Ke & Chávez (2013).

Chavez & Longerbeam (2016)

Culturally Responsive Teaching

Attend to:

- Classroom culture/learning environment

- Curriculum

- Instruction/Pedagogical Practice

Strategies That Support Students in Taking Charge of Their Own Learning

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Teaching Students to Fish

1. Promote study strategies and time management skills.
2. Promote student discourse.
3. Rethink your questioning strategies.
4. Provide problems that can be solved in multiple ways.
5. Provide time for student reflection.
6. Provide timely feedback.
7. Provide explicit instruction in how to prepare for class.
8. Acknowledge effort and the value of mistakes.
9. <u>Connect</u> students to supports.

Breakout:

What kinds of assessment do you do with your students, other than exams?

What kinds of assessment would you like to know more about?

What other reactions or questions do you have about today's content so far? (Culturally responsive teaching, Teaching students to fish)

Preparing to Assess Your Program

Definition of Equity-Mindedness...

...refers to the perspective of thinking demonstrated by practitioners who call attention to patterns of inequity in student outcomes.

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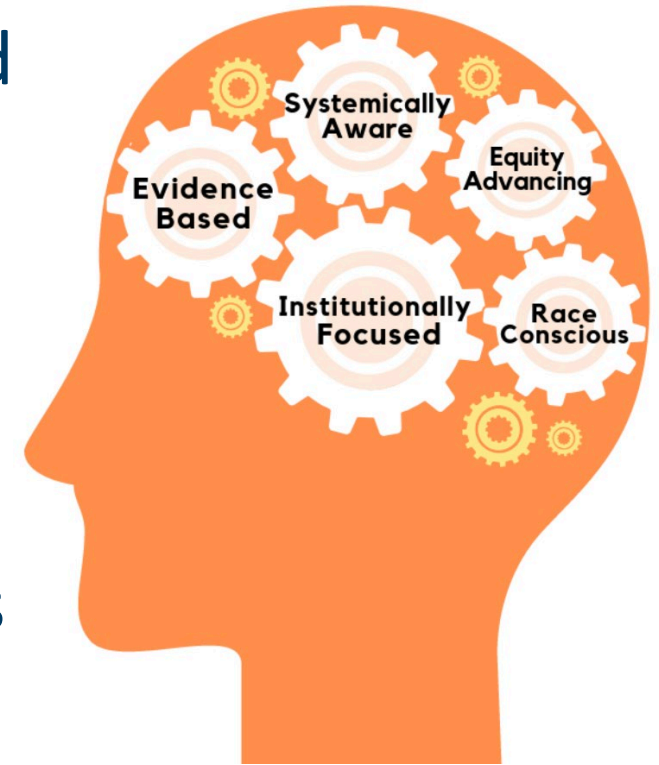
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Making the Invisible Visible: Data Disaggregation

Consider how these data disaggregations can:

★ Inform the campus leadership team of systemic barriers and inequities relevant to mathematics pathways and corequisite supports; and

★ Guide faculty and staff to act towards improving equitable access, learning, and outcomes.

Full-time/Part-time	Pell-eligible status; low-income
Gender	Disability
Race/Ethnicity	First-generation
Age Groups	Veterans

Making the Invisible Visible: Data Disaggregation

★ Necessary to break data apart and observe patterns in smaller groups, in order to know what is or is not working and for whom.

★ Examining data disaggregations among student groups is a first step for ongoing discussions to:

| Establish common standards of excellence | Target resources and supports for students | Engage in cyclical equity-focused data use processes |
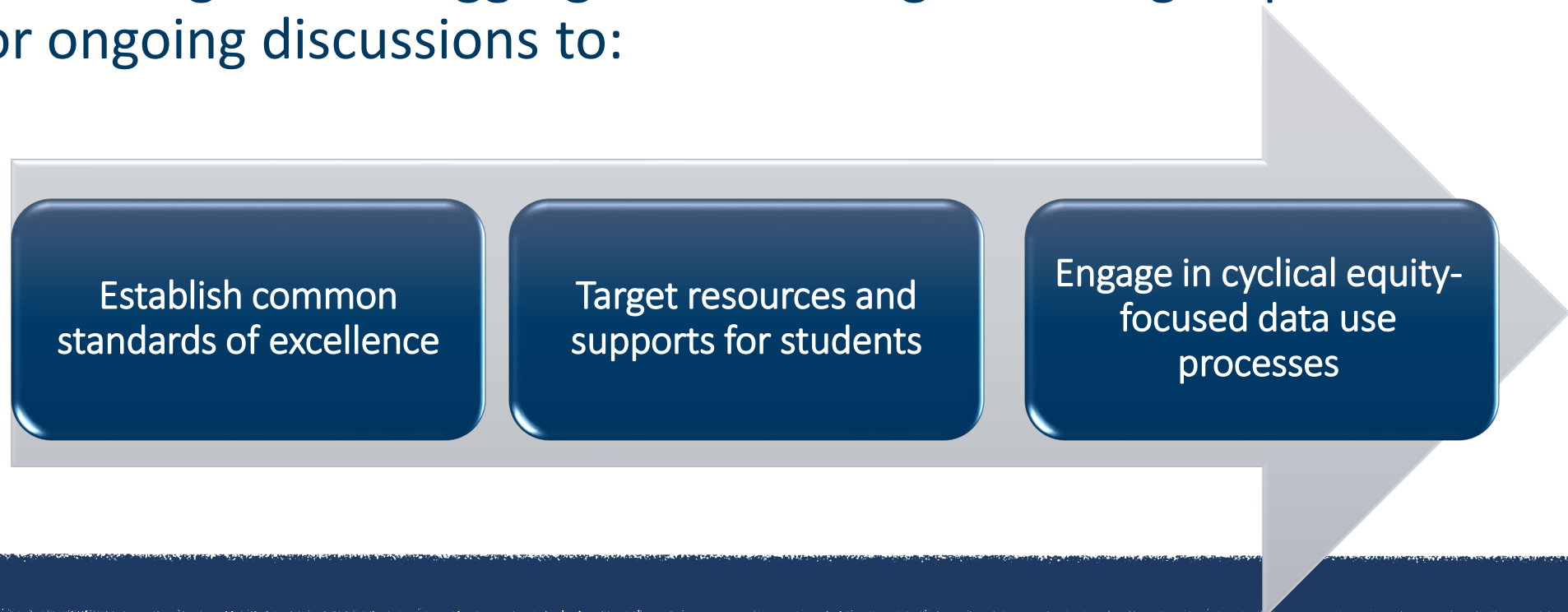
Program Assessment to Include:

- Access rates
- Retention and success rates (throughput rates)
  - Throughput – the rate at which students complete a college-level class over a given period (one semester or one year usually)
- Feedback processes
- Department-wide policies
- Common course assessments

Program Assessment

- ➢ Access rates
  - ➢ Students who take college-level math class in their first year
- ➢ Retention and success rate comparisons
  - ➢ Students who take the course with & without corequisite support
  - ➢ Corequisite students to traditional developmental students
  - ➢ Disaggregating the data (gender, race/ethnicity, SES, etc.)
  - ➢ By placement band
  - ➢ Throughput rates (pre-reform to post-reform)

Program Assessment

➢ Mid-semester and/or end-of-semester feedback loop

  ➢ Students and faculty

  ➢ Surveys and/or focus groups

➢ Department-wide policies

  ➢ Attendance, grades, etc., OR

  ➢ Allow differences and compare

➢ Common course assessments

  ➢ Exams, mid-terms, and/or finals

Program Assessment

➢ Longitudinal measures

  ➢ Success in the next math course

  ➢ Success in courses that have math prerequisites (e.g., science courses)

  ➢ Credit attainment/progress toward degree

  ➢ Graduation

Be sure to track students who took the college-level class by itself and with corequisite support!

Qualitative Data and Student Voice

Benefits of Examining Qualitative Data

➢ Better understand YOUR math students' cognitive and non-cognitive strengths and challenges.

➢ Determine areas for improvement.

➢ Reduce barriers impeding math students' success.

➢ Identify barriers contributing to inequities.

➢ Hear the voices of those from marginalized student populations.

➢ Understand impact of courses for other programs.

➢ Move from anecdotal to evidence-based conversations.

Voices

Students

- How do you think your math students feel about studying mathematics?

Faculty

- What would your fellow mathematics faculty say?

Other stakeholders

- What would your fellow programmatic faculty say?

- What do student support service staff say?

Equity is at the Heart

Qualitative data allows for voices of those typically not heard.

Capturing the student voice:

- Surveys
- Focus groups

Understanding the Student's Math Journey

Sample research questions: Students' perspective

- How satisfied are our math students with their classroom experience?

- How do our students rate their mathematics self-efficacy?

- How well are we preparing our students with the mathematical skills and competencies needed to be success in their programs of study?

- How are marginalized student populations experiencing success in their mathematics classes and corequisite supports?

Understanding the Student's Math Journey

Sample research questions: Faculty & Staff

- What perceptions do faculty have of why some students experience success versus students who do not experience success?

- What professional learning opportunities would support part-time faculty to teach corequisite support courses?

- What are student support staff learning from students who experience success (or lack of success) in gateway mathematics courses?

Continuous Improvement

All of the data together helps us with the continuous improvement of instruction.

It is important to work with your research offices now to develop your assessments plans so they can be put into action quickly.

Breakout:

What kinds of course- and section-level assessment do you already do?

Have you solicited student feedback in the past? What, if anything, has today's session led you to consider for the future?

Other questions and sharing.

Selected Citations and Additional Reading

- Chavez, A., & Longerbeam, S. (2016). Teaching Across Cultural Strengths: A Guide to Balancing Integrated and Individuated Cultural Frameworks in College Teaching. Sterling, VA: Stylus Publishing, LLC.

- Hammond, Z. (2013). Ready for Rigor: A Framework for Culturally Responsive Teaching. https://crtandthebrain.com/wp-content/uploads/READY-FOR-RIGOR_Final1.pdf

- Harris, F., & Wood, L. (2020, March 27). Employing equity-minded and culturally affirming teaching and learning practices in virtual learning communities [webinar]. CORA Learning. Retrieved from https://www.youtube.com/watch?v=aMrf_MC5COk (In particular, the five principles and associated strategies start at about minute 28.)

- Learning Forward (2018). Culturally Responsive teaching puts rigor at the center. The Learning Professional, 39(5). https://learningforward.org/wp-content/uploads/2018/10/culturally-responsive-teaching-puts-rigor-at-the-center.pdf

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