"SENDING THE RIGHT SIGNALS WITH QM"

Presented by Polk State College

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POLK STATE COLLEGE

- Located in Central Florida
- Serving approximately 16,000 students annually via F2F, Hybrid and Online
- Two Main Campuses & Five Centers
- 20+ AA/AS Degree Pathways
- 6 Bachelor Degree Programs
- Approximately 500 Faculty
- Currently 46 Certified QM Courses at the College

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WHAT IS RIGHT SIGNALS

- Lumina Foundation has long worked toward an education-attainment goal that calls for 60 percent of Americans to hold a college degree or other high-quality postsecondary credential within 10 years – by 2025.
- The Framework uses competencies – what the learner knows and is able to do – as common reference points to help understand and compare levels of knowledge, skills and abilities that underlie degrees, certificates, industry certifications, licenses, apprenticeships, badges and other credentials. Competencies are understood both in industry and academia and can be applied in multiple contexts, making them a powerful unifying way to examine credentials.
- The Framework is intended to connect the dots among diverse credentials by using common language to describe what recipients of each credential should know and be able to do.
- If you're developing and awarding credentials, using them to hire employees, creating competency-based curriculum, or helping students find a career pathway, the Framework has been developed to support your work.

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THE BETA CREDENTIALS FRAMEWORK

The Framework is a structured tool that helps the user make judgments about underlying competencies (existing or in development) represented in a credential. The Framework is organized around two learning domains and eight levels. The two learning domains are 1) Knowledge and 2) Skills (specialized, personal, and social). The eight levels indicate relative knowledge and skill complexity, breadth, and/or depth. This structure provides the ability to translate any credential and to place it on a common reference platform for analysis.

APPLICATIONS USED

STACK CREDENTIALS OR SEQUENCE COURSES

The Stacking Credentials Application uses comparative profiling to understand an array of credentials or potential credentials in a career or learning pathway. It identifies overlaps in related courses and credentials and helps show relationships in order to establish, link and optimize learning and career pathways.

COMPARE COURSES, PROGRAMS AND/OR CREDENTIALS

Comparing profiles of multiple credentials provides an understanding of competency related differences between courses and/or credentials. It helps differentiate the content and outcomes between similar courses and credentials and provides the basis for a comparative analysis.

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STACK CREDENTIALS

The Stacking Credentials Application uses comparative profiling to lead to a better understanding of all the credentials in a career or learning pathway. It reduces overlap in related courses and credentials, and helps show relationships in order to establish, link and optimize learning and career pathways.

FIGURE 8:

STEPS TO BUILD LEARNING PATHWAYS OR STACK CREDENTIALS

FIGURE 9:

EXAMPLE OF CROSSWALK FORM

COMPETENCIES REPRESENTED BY CREDENTIAL A, COURSE, OR CLUSTER OF COMPETENCIES	COMPETENCIES REPRESENTED BY CREDENTIAL B, COURSE, OR CLUSTER OF COMPETENCIES	NOTES
Competency #1	Competency #a	
Competency #2		No competency in Credential B maps against Credential A
Competency #3	Competency #b	
Competency #4		No competency in Credential B maps against Credential A
Competency #5	Competency #c	
Competency #6	Competency #d Competency #a	Because of granularity differences two competencies in Credential B map against one in Credential A

COMPARE COURSES/CREDENTIALS

Comparing profiles provides a better understanding of differences between courses and/or credentials. The differences may be in actual subject matter or in the competency levels or both. These differences become evident through this application. Profile comparisons help differentiate similar courses and credentials and are the basis for comparative analysis.

FIGURE 4:

STEPS TO COMPARE PROFILES

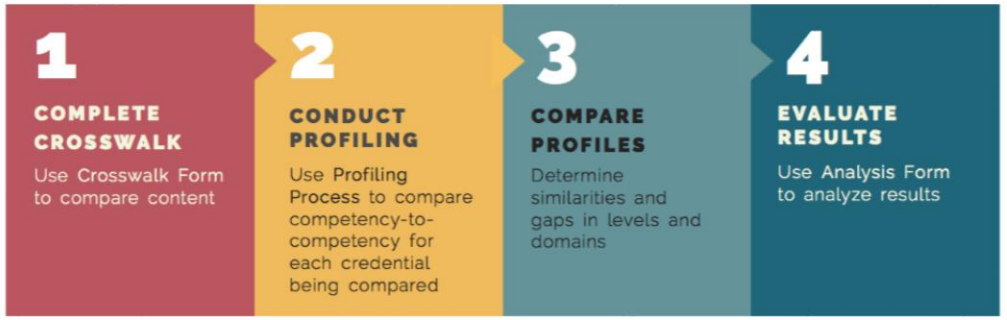

FIGURE 5:

EXAMPLE OF CROSSWALK FORM

COMPETENCIES REPRESENTED BY CREDENTIAL A, COURSE, OR CLUSTER OF COMPETENCIES	COMPETENCIES REPRESENTED BY CREDENTIAL B, COURSE, OR CLUSTER OF COMPETENCIES	NOTES
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CATWALK OF SKILLS

- Skills and levels were identified on 8 different levels and then cat-walked between disciplines to identify common skills that equate to a possible competency
- Identified skills coupled together from each discipline form recognizable competencies that could equate to industry certifications
- Produce students with industry certifications that accompany their completed AA degree, via the Right Signals OEEE course model

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POLK STATE COLLEGE AND RIGHT SIGNALS

- Designed three general education courses that align with the needs of students in our Engineering Technology program
- The three courses developed were:
  - Survey of Physical Science
  - MAT1033
  - MAC1105
- These courses were chosen as gateway courses that most students struggle to complete or need open access to within this program to complete at the desired pace.

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POLK STATE COLLEGE ADVANCED TECHNOLOGY CENTER

- Home to our Open Entry, Early Exit Engineering Technology degree program
- Home to our Corporate College Initiatives and Partnerships with Local Industry
  - 3D Innovation Lab
  - Advanced Manufacturing
  - Industrial Maintenance & Machining
  - IT/Computers
  - Supply Chain
  - Workforce Grants

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ENGINEERING TECHNOLOGY PROGRAM

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ENGINEERING TECHNOLOGY PROGRAM

- The Engineering Technology Program is an Associate of Science degree program. It includes 18 credit hours of General Education courses, 18 credit hours of Technical Core courses, and 24 credit hours of specialized Advanced Technical courses.
- The Right Signals project was centered around our existing Engineering Technology program and format.
- The courses developed are to coincide with the Engineering courses providing a methodology for the students in this format to accomplish other course requirements in the same format.

OPEN ENTRY EARLY EXIT FORMAT

- Students enter a course at any time during the semester
- Must complete each course within 5 weeks from start date
- No penalty for finishing early
- Each Course is broken into 3 parts (-1, -2 and T (mastery))
  - 1 credit each
  - Must be taken in order

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COMPETENCY BASED COURSE MODEL

- Takes a three credit course and breaks it down into three, one credit courses that are completed within 5 weeks of each start date.
- Example:
  - MAT1033 - 1
  - MAT1033 -2
  - MAT1033 - T
- Each course is worth 1 credit and the student has 5 weeks from start date to complete each.

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PRACTICE WITH RIGHT SIGNALS

Skills and Competencies Catwalk

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ACTIVITY

- When you entered the room you were given a skill card or a competency.
  - These are actual skills/components from our Engineering, Math and Science Courses at Polk State College
- Skills Cards (Math or Science) – Find the competency you think you best fit into
- Competency Cards – Position yourselves around the room and be sure to hold your competency card facing out. Assist skills cards if you think they may belong to you.

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SKILLS, FIND YOUR COMPETENCY

Things to consider:

- *How does my skill fit in?*
- *What is your impression of the combination of skills that make up the competency?*
- *Do you think you found the right competency or could you fit in somewhere else?*

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SHARE

- One member of each group will share the skills paired with the competency with an explanation/justification of the relationship.

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REGROUP – FIND YOUR CORRECT FIT

Competency #1 : *Describe the relationship between charge and current.*

- MATH: Solve direct variation problems. Voltage and current have a direct linear relationship. If voltage goes up, current does as well.
- SCIENCE: Demonstrate an understanding of the fundamentals of electrical systems

Competency #2 : *Describe how a single-element resistive circuit operates based on Ohm's Law (V=IR).*

- MATH: Add, subtract, multiply, divide complex numbers, specifically as related to Ohm's Law.

$$I = \frac{E}{R+(X_L-X_C)i}$$

- SCIENCE: Demonstrate an understanding of the fundamentals of electrical systems

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REGROUP – FIND YOUR CORRECT FIT

Competency #3 : *Use the mathematical relationship between voltage and capacitance to calculate the energy stored by a capacitor.*

- MATH: Solve a formula for a specified variable. Specifically, the formulas for charge, $q = CV$, and the formula for Energy, $E = \frac{1}{2}CV^2$.
- SCIENCE: Demonstrate an understanding of the fundamentals of electrical systems

Competency #4 : *Explain the relationship between voltage and potential energy at the atomic level.*

- MATH: Solve rational equations. Specifically, solve for potential energy ($U_e = k\frac{q_1 q_2}{r}$).
- SCIENCE: Demonstrate understanding of the types and properties of chemical bonds.

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REGROUP – FIND YOUR CORRECT FIT

Competency #5 : *Explain the linear relationship between torque and speed of DC electric motors.*

- MATH: Solve indirect variation problems. For a fixed voltage, the speed of the motor is inversely affected by the load. Increase in load torque results in a decrease in speed.
- SCIENCE: Demonstrate understanding of common electromagnetic devices

Competency #6 : *Demonstrate knowledge of Boyle's Gas Law ($P_1V_1 = P_2V_2$) and Charles' Gas Law ($\frac{V_1}{T_1} = \frac{V_2}{T_2}$) and use these laws to calculate properties of fluid power circuits.*

- MATH: Solve a formula for a specified variable. Specifically, the formulas for Boyle's and Charles' Gas Law.
- SCIENCE: Demonstrate understanding of the Kinetic Theory of Gasses and the Laws of Thermodynamics.

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REGROUP – FIND YOUR CORRECT FIT

Competency #7 : *Perform basic statistical calculations using mean, median, mode and standard deviation.*

- MATH: Summarize data by use of measure of central tendency and variation.
- SCIENCE: n/a

Competency #8 : *Compare and contrast polymer shaping processes of extrusions and injection molds.*

- MATH: n/a
- SCIENCE: Identify the different properties of polymers

Competency #9 : *Make calculations of period, frequency and wavelength in A/C systems.*

- MATH: Solve a formula for a specified variable. Specifically, the formulas for frequency ($f = \frac{1}{T}$) and wavelength ($\lambda = \frac{c}{f}$).
- SCIENCE: Demonstrate understanding of wave processes and behaviors

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DISCUSS

- As an institution, instructor or instructional support person, what is the gravity of this type of alignment between courses and disciplines?
- How could you take this idea back to your institution and use it for positive growth and impact?
- Identify areas of your institution where this type of cat-walking might be a beneficial process to go through to create a competency based recognition for students.

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QM AND OEEE – WHY WE'RE HERE

- One review covers all three 1 credit modules (must be same subject)
  - MAT1033-1
  - MAT1033-2
  - MAT1033-T
    - All three modules equal out to 1 full course
- An Introductory discussion is not needed in -2 or –T
- Contact information should be included in all 3 course modules
- Important links to institutional and course policies etc. need to be linked in each course along with the normal requirements of a QM certified course.
- The rubric is the same for the CBE courses as is for the non-CBE courses
- Courses were designed with QM at the forefront to give them more reliability and structure to assist in the format of the program.

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CHALLENGES

- Instructor course load
- Lacking a system that can maintain a student for the 5 week term automatically enrolling and locking access at the beginning and end of the course
- Low enrollment in the program
- Due to low enrollment the designed courses have not been run through a QM review

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IMPLICATIONS

- Possibility of designing an AA degree based on the OEEE model with 1 credit 5 week courses
- Competency mapping between additional programs to identify skills and certifications that could equal common measurable outcomes and industry recognized preparedness.

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Thanks for attending our session!!

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