Using the U.N. SDGs to Foster Systems Thinking in Incoming First-Year Students

with Eda Davis-Lowe, Resham Shirsat, and Nardia Cumberbatch
Icebreaker: Think, Pair, Share

How are you or your institution already incorporating the UN SDGs (or sustainability) in the curriculum?
Valencia College, Orlando, Florida

• Primarily a two-year institution

• Valencia offers an Associate in Arts degree, 36 Associate in Science degrees, 4 Bachelor of Science degrees, and 90 certificate programs

• Six campuses across two counties
  – ~70,000 students

• Faculty consists of 546 full time and 1,065 part-time/adjunct

• Inaugural winner of the Aspen Prize for Community College Excellence

• Celebrated its 50th anniversary last year
LSAMP Program – National Science Foundation

- **Bridge to the Baccalaureate**
  - To increase the number of URM students completing associate degrees and transferring into baccalaureate degree STEM majors at the university level

- **Alliance Goal**
  - To achieve a 25% increase in the number of URM transfers

- **Alliance Structure**
  - 3 two-year colleges working with 5 university partners to establish data-sharing and transfer agreements
Summer STEM Institute
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• **Video**

• One component of LSAMP project funded in 2013

• Incoming first-year students

• Weeklong experience, 8am – 4pm

• Program framework of STEM explorations, college readiness, collaborative project, and peer community

• One institution, multiple campuses (3)
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- Expanded program component of LSAMP project funded in 2017
- Implemented common framework across all alliance institutions:
  - Lake-Sumter State College
  - Polk State College
  - Valencia College
- Increased access for incoming students (5 campuses across all Central Florida STEM Alliance institutions)
Why Sustainability?

• LSAMP Goals
  – Introduces new career pathways
  – Develops soft skills as well – empathy, collaboration, cooperation, etc.
  – Relatable - Connects to daily lives

• Context Enhancement
  – Career exploration to problem-based learning

• Empowering Students as Community Innovators
  – Equipping students to act and be change makers
  – Promoting complex problem solving, critical thinking, creativity skills
  – Challenging students to think about local and global community
Framework for the Capstone

- Possible local (FL) solutions to one of nine (directly STEM related) of the UN SDGs
  - #2 Zero hunger
  - #6 Clean water and sanitation
  - #7 Affordable and clean energy
  - #9 Industry, innovation and infrastructure
  - #11 Sustainable cities and communities
  - #12 Responsible consumption and production
  - #13 Climate action
  - #14 Life below water
  - #15 Life on land
Structure of Capstone

- Designed for students to engage in academic research and enhance social skills
  - Four-student project teams
  - Dedicated project time
  - Poster presentations during college-wide poster walk
  - Poster walk assignments
  - Structured end-of-day reflection time, M-Th
Sample Resources:
- Research guide
- Poster board
- Glue
- Markers
- Printing
- Computer with Internet access
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What We Learned

Extent to which one demonstrates certain skills (Gains of 0.04 – 0.45, listed from highest to lowest gain):

• Understand people’s relationship to nature
• Act as responsible citizen locally and globally
• Use resources efficiently
• Think of the whole system and the links when considering new ideas
• Problem solve using many subjects
• Analyze a situation using many subjects
• Plan for the long-term as well as the short-term
• Consider the ethical issues of a situation
• Adapt to new situations
What We Learned

Familiarity with aspects of STEM (Gains of 1.26 – 1.46, listed from highest to lowest gain):

- Tools and methods used in STEM
- Problems or challenges of STEM
- How information is used to answer questions and/or solve problems in STEM
- Key ideas or concepts in STEM
What We Learned

Confidence in ability to succeed in aspects of STEM (Gains of 0.21 – 0.55, listed from highest to lowest gain):

• Choosing and using tools
• Talking about ideas, discoveries and/or problems
• Researching and studying on my own
• Understanding articles, reports, discussions and/or findings
• Identifying key ideas or concepts
• Looking for resources and/or help
• Pursuing a career
• Taking classes
What We Learned

Readiness for college – five of 12 factors with largest gains:

• Aware of college resources to assist with financial issues (0.67)
• Confident when communicating with others (0.47)
• Understanding college culture and expectations for success (0.40)
• Comfortable interacting with people not known previously (0.36)
• Willing to take initiative to solve problems (0.24)
What Students Told Us

“\textit{I feel accomplished and excited about my group’s selected SDG. I am more aware and understanding on the environment. I wish this week would never end. One of the best experiences for my career and professional development.}”
What Students Told Us

“STEM is not just the creations we make or the doctors we can be. It’s about taking responsibility for our actions and finding solutions to them as well. It’s about being efficient and being aware, knowing that everything we do affects others and the environment. STEM is not just about lab coats, metal pieces, or a male-dominated workforce but also the essence of nature, the preservation of its beauty and ability to control the very way we survive and live. It’s an answer to the destruction we have wreaked, a solution to limit discrimination, and a way to better global livelihood.”
Upon successful completion of the program, students were awarded a tuition waiver for one math course.
Your Turn!

• What is one way you can infuse the UN SDGs into existing or new programming at your institution

• Share first with your table

• Summarize your idea in five words

• Share your idea with the large group: Go to www.menti.com and use code 28 10 45
Replicability

- Research Guide: [https://libguides.valenciacollege.edu/AASHE2018](https://libguides.valenciacollege.edu/AASHE2018)
- Access resources, assignments, reflection prompts, poster directions, etc.
- Copy or customize for your needs
Careers With Purpose

- Purpose

- You Love It

- You Are Great At It

- The World Needs It

- Profession

- Vocation

- Passion

- Mission

Sustainability. Thinking more. Taking less.
Closing Words of a Student

“...Funny to think how at the beginning I had a different group and SDG but stopping to think of what I was passionate for and what I wanted to make a change in, I picked the one I have now. This exposure has absolutely challenged me to talk to others about my passions and see who else might be interested in them. The action I would partake in is spreading the word to those who might be interested.”
Questions? Thank You! Contact:

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