

Malawi STEM Education Workshop: Development of a Certificate Program for Secondary School Agriculture and Science Teachers Experiential Learning and Entrepreneurship

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innovATE
Innovation for Agricultural Training and Education

<http://www.oired.vt.edu/innovate/>



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Wamkulu Palace Hotel and
Conference Center
Lilongwe, Malawi
September 28, 2015



Session overview

- Review workshop goals
- Introduce InnovATE
- USAID Local Systems Framework
- Experiential Learning and STEM
- Entrepreneurship and Youth
- Key Questions
- Feedback

Workshop Objectives

- Introduce current STEM pedagogies and curriculum ideas for better preparing science and agriculture teachers in Malawi.
- Discuss opportunities for course delivery through Open Distance Learning (ODL) for increased accessibility.
- Develop a Certificate Program Proposal in STEM Education for secondary school teachers.

What is innovATE?



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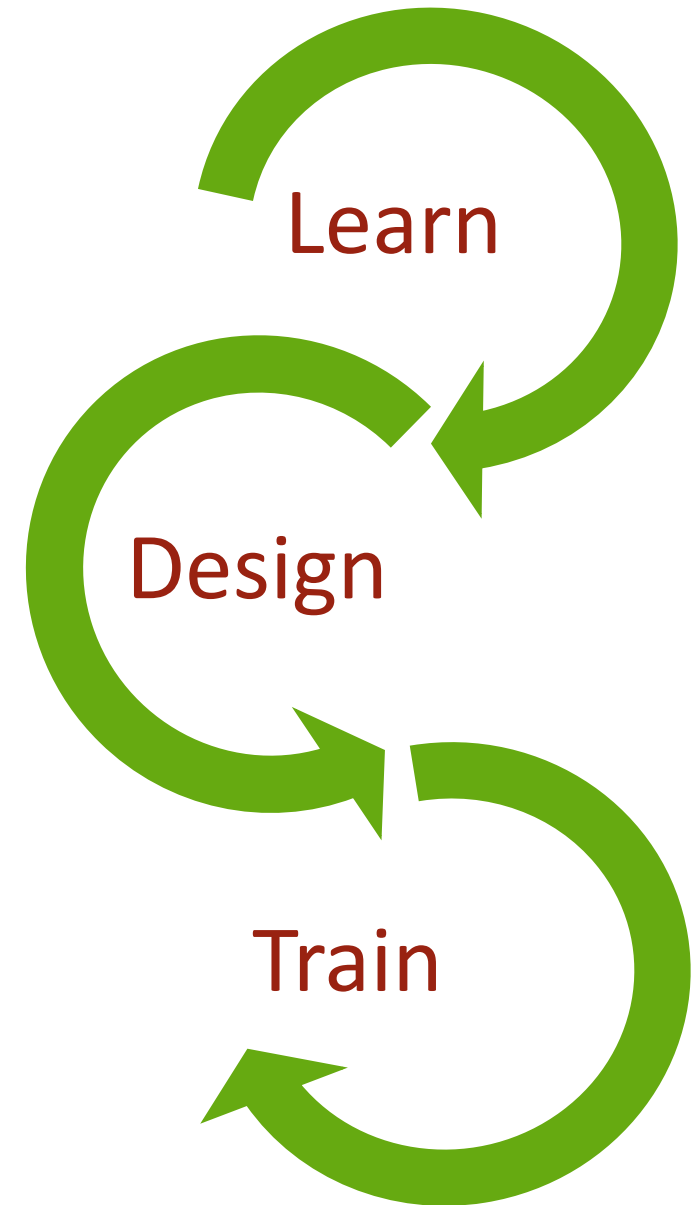
Our Mission

To cultivate the human and institutional capacity necessary for developing countries to promote rural innovation needed to achieve sustainable food security, reduce poverty, conserve natural resources and address other rural problems.

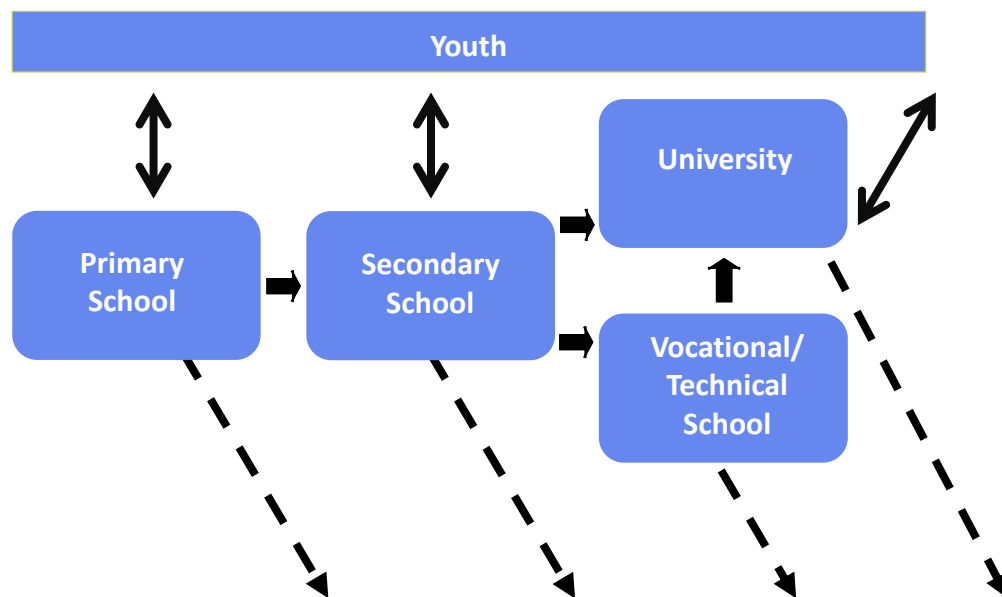


InnovATE's Approach to AET

- Administration and management
- Educational policy
- Curriculum development
- Pedagogy and teaching excellence
- Faculty capacity; Outreach
- Infrastructure; Student services
- Gender balance and equity
- Youth workforce development
- Entrepreneurship education



Supply



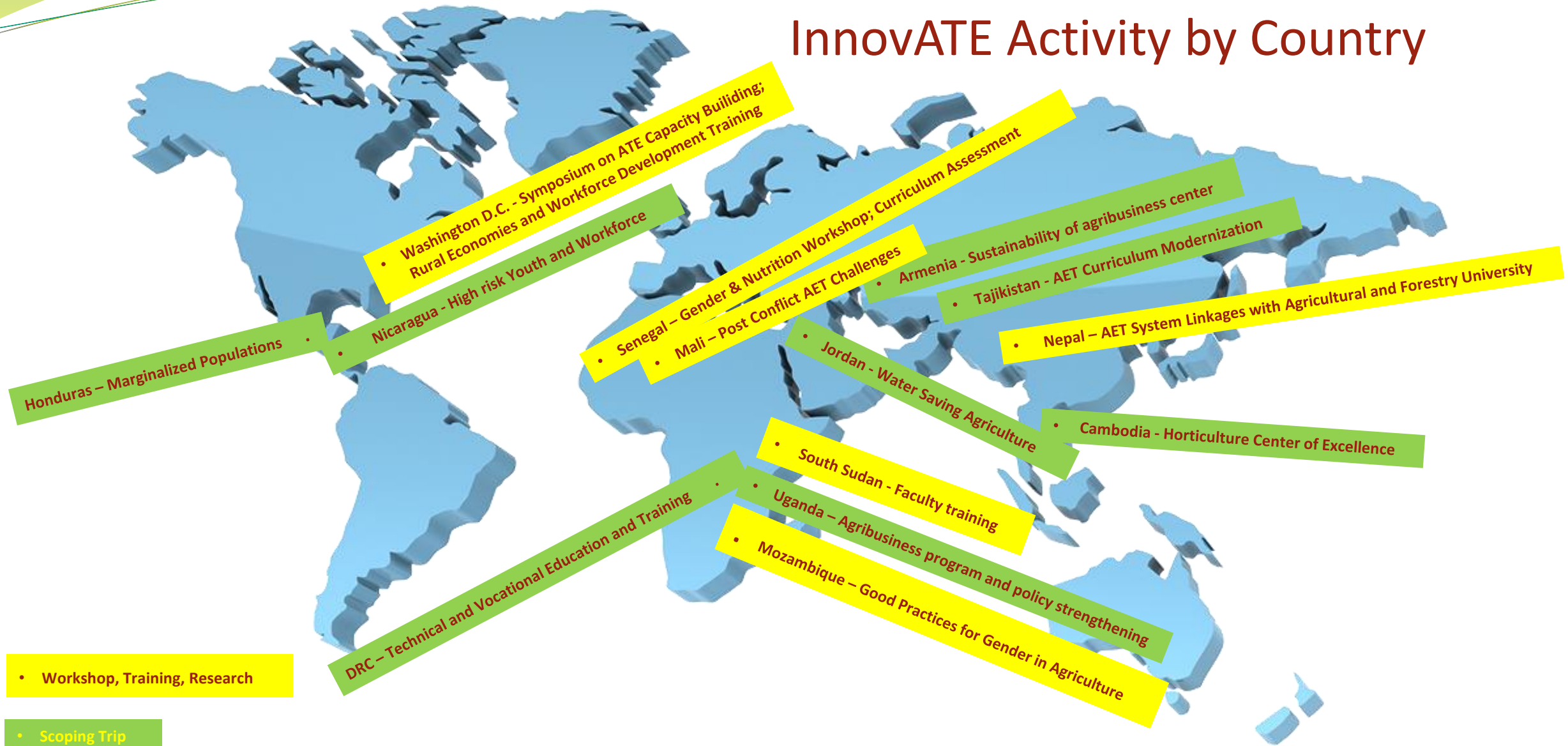
Demand



Agricultural Value Chain



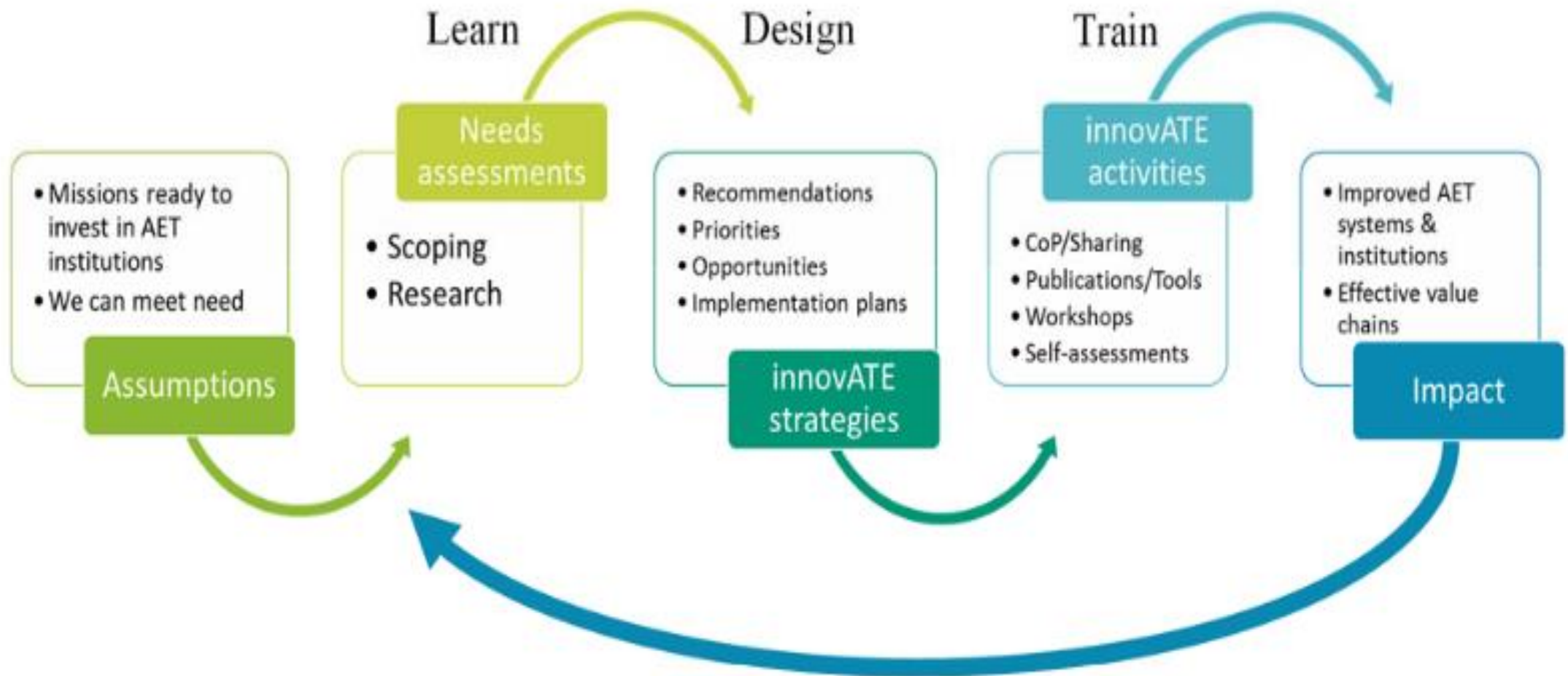
InnovATE Activity by Country



InnovATE's Key Messages

- Sustainability requires investments in long-term, local human and institutional capacity development for AET
- The AET pipeline must be strengthened to populate local economies with diversified high quality workforces
- Institutions must adopt gender mainstreaming policies and practices
- Value chain workforce needs should inform AET curriculum and program development

Theory of Change



- LOCAL SYSTEMS:
A FRAMEWORK FOR
SUPPORTING SUSTAINED
DEVELOPMENT



AFP Photo: Nicolas Asfour



AFP Photo: Sia Kambou



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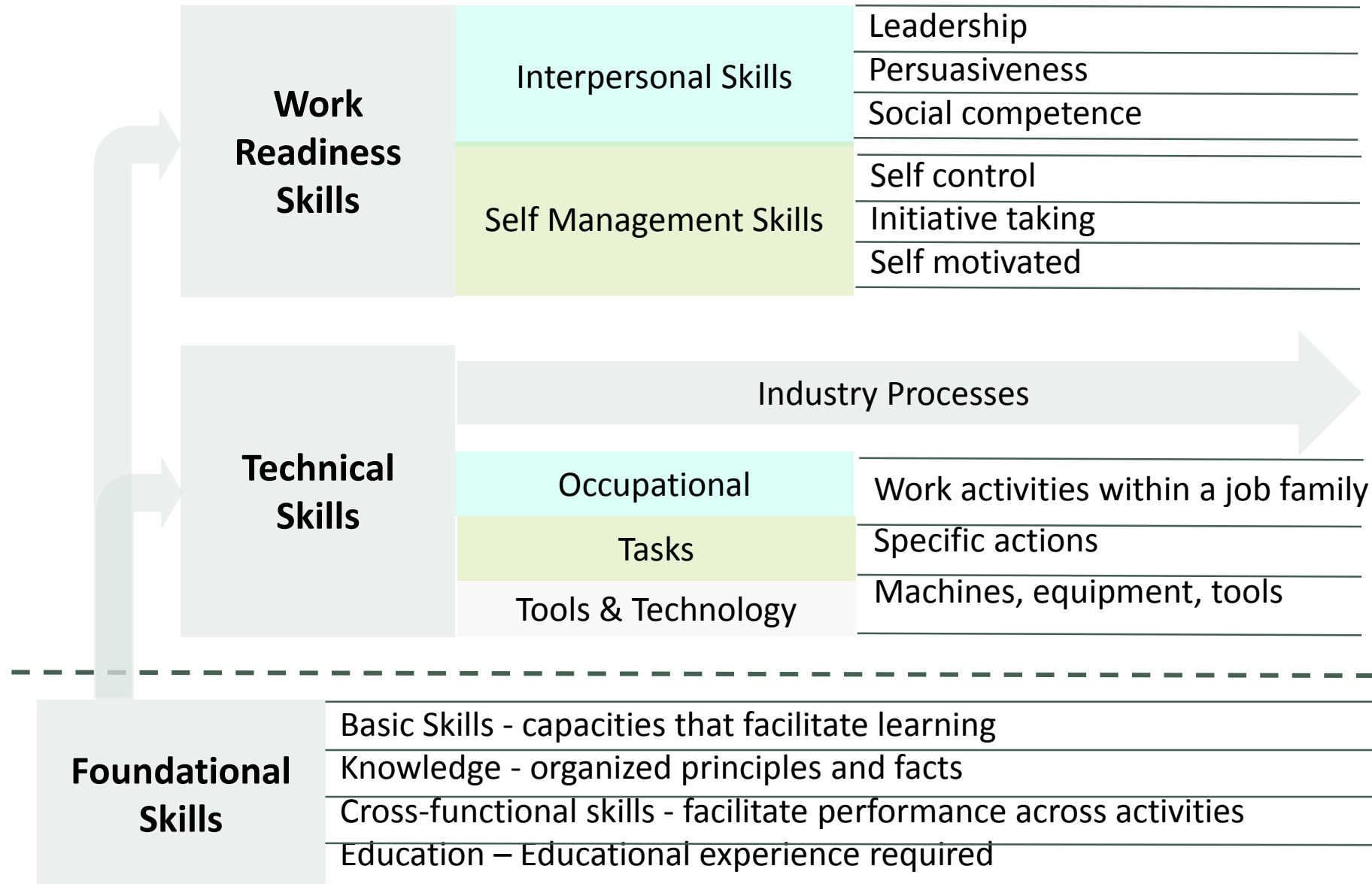
AFP Photo: Hoang Dinh Nam

The Five Rs

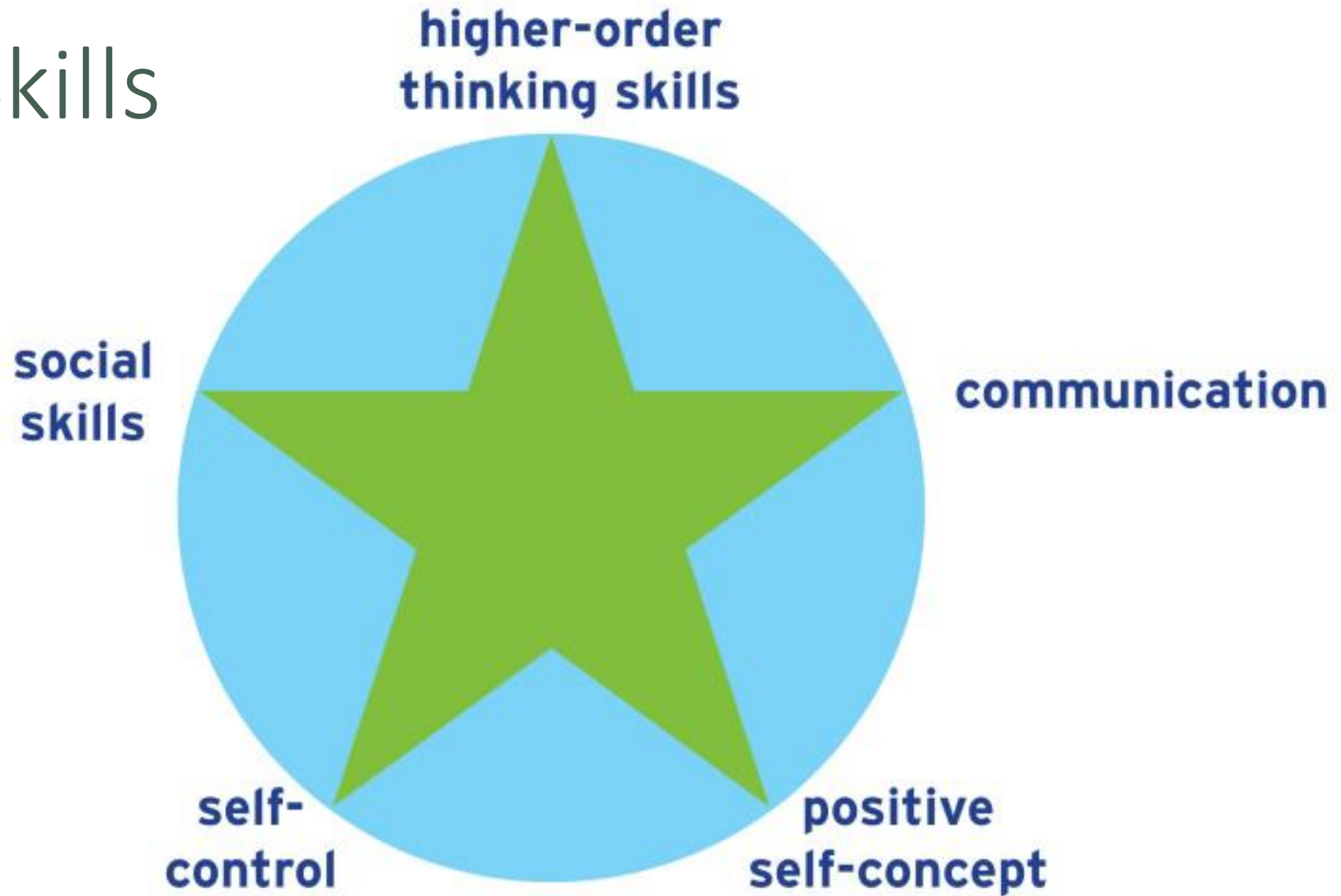
- **Resources:** finances, raw materials or inputs
- **Roles:** producers, consumers, funders and advocates
- **Relationships:** interactions between actors
- **Rules:** define or assign roles, determine the nature of relationships, or establish the terms of access to resources
- **Results:** Includes measures of the overall strength of the local system as well as traditional outputs and outcomes.

Think systemically

- What are the results to achieve?
- What resources are available or needed?
- Who are the stakeholders?
- How do they interact?
- How are they governed?
- How do the outcomes change the system and what results are needed next?



Critical Skills



Project Based Learning

- Uses actual and simulated environments where learners carry out hands-on learning activities, experience real or virtual work environments.

Blended Learning

- Uses multiple delivery methods to ensure uptake by different types of learners.

Hands-on Learning Sparks STEM Interest



Hands-on interactive projects get more students interested in science at an early age compared to the traditional lecture and textbook method."

66%

of kids participating in STEM programs say their favorite thing is hands-on activities and projects."

Top Ways to Attract Youth to STEM

Grow interest in STEM-related job.

①

59%

of youth would like to have a job related to science when they graduate from school."

Create STEM Leadership Opportunities to Build Confidence.

③

69%

of 4-H STEM program youth participants complete a STEM community service project.

51%

of 4-H STEM program youth participants teach others about science."



②

Make STEM fun and accessible beyond the classroom.

70%

of youth say science is their favorite subject when participating in positive youth development programs.

60%

do science-related activities not related to school work when participating in positive youth development programs."

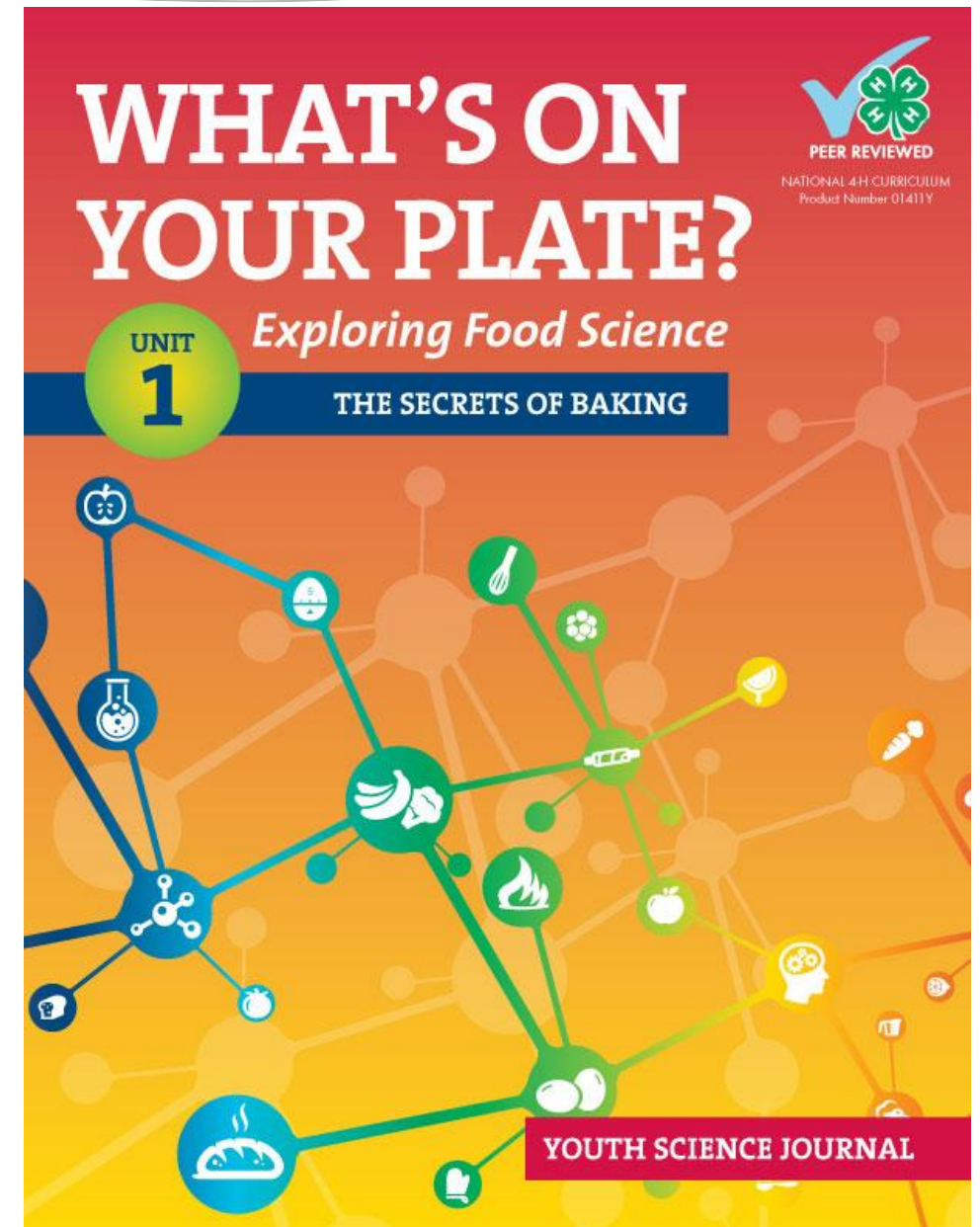
Note: All statements above are the outcomes of 4-H youth program evaluations.

Experiential Learning



- In the 'classroom'
- In the home
- With peers
- On the bus
- Virtual 'workplace'
- Simulated 'workplace'
- Blended learning
- Mixed study/work
- Apprenticeship
- Mentorship
- Anywhere

- Teacher designs and facilitates experiences
- Learner constructs knowledge and acquires abilities based on experience and reflection
- Learner links experience with critical analysis
- Teacher encourages the student to understand problems and search for innovative solutions.



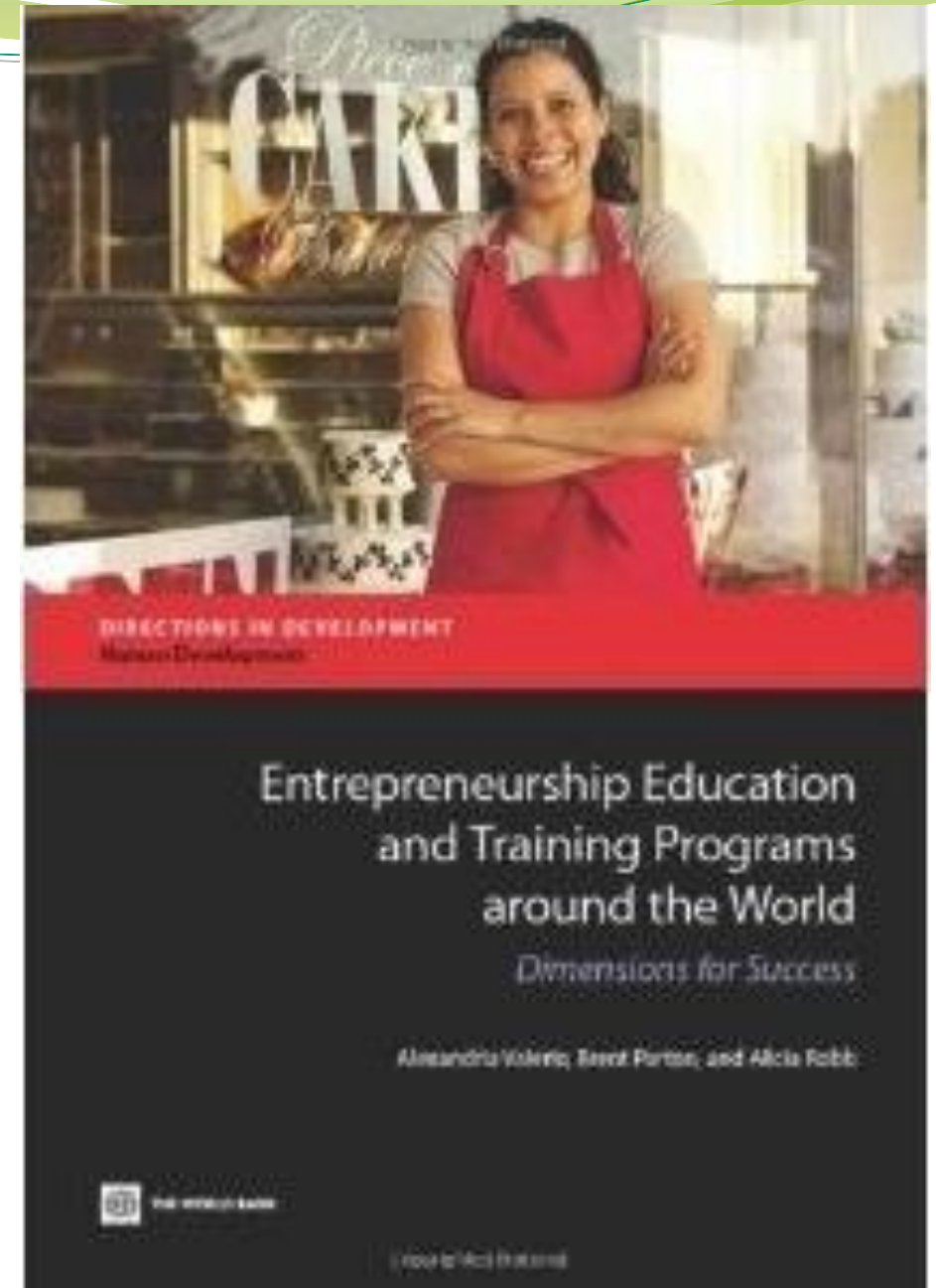
Entrepreneurship



- Knowledge
- Skills
- Competencies
- Behaviors
- Attitudes
- Opportunities
- Enabling environment

Entrepreneurship Education—Secondary Education

- BizWorld BizWorld, Netherlands *Netherlands*
- EOEAS Entrepreneurial Orientation and Education in Austrian Secondary Schools Study *Austria*
- INJAZ Junior Achievement Middle East
- JACP Junior Achievement Company Program *Sweden*
- NFTE Network for Teaching Entrepreneurship
United States
- JAN Junior Achievement Namibia *Namibia*
- KAB Know About Business *Syrian Arab Republic*
- SAIE South African Institute for Entrepreneurship/Business venture course
South Africa
- YE Young Enterprise *Denmark*





Integrating STEM Education

- What are the results to achieve?
- What resources are available or needed?
- Who are the stakeholders?
- How do they interact?
- How are they governed?
- How do the outcomes change the system and what results are needed next?

References

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InnovATE is supported by a grant from USAID and managed by Virginia Tech's Office of International Research, Education, and Development (OIREd). This project was made possible by the United States Agency for International Development and the generous support of the American people through USAID Cooperative Agreement No. AID-OAA-L-12-00002

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