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Changing our Thinking to Situate them in the 21st Century Context: Nurturing Giftedness and Talent among Students in Higher Education

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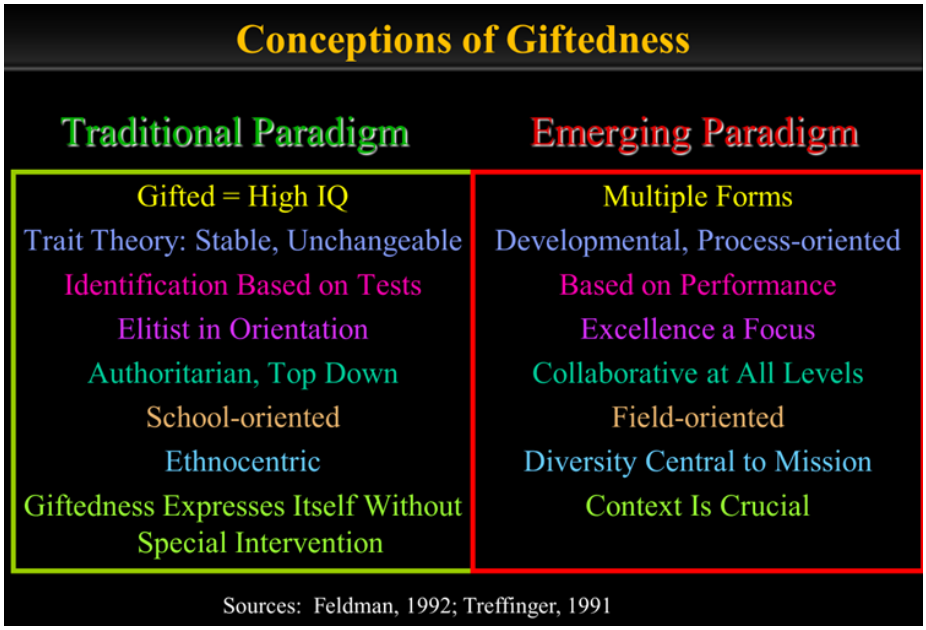
If we educators continue to live in our past, how can we expect to prepare our students to live in their future? --C. June Maker (2024)

Over the years, leaders have called for a change in thinking, a paradigm shift. In the early 1990s, Feldman (1992) and Treffinger (1991) described what they perceived as an emerging paradigm (Figure 1).

Figure 1. Traditional and Emerging Paradigm



This shift has not occurred, and is more critical as we attempt to prepare our young people for an unknown and unpredictable future (Ambrose, 2005; Maker, 2021; Maker, et al., 2023b; Sternberg, 2020). A change in thinking may be more important for students in higher education

than for younger students because they are preparing for careers in various industries, organizations, and institutions. According to an IBM survey of 1541 Chief Executive Officers in 60 countries and 33 major industries, creativity is the most valuable ability for future top managers, along with the other 21st Century skills of critical thinking, collaboration, and communication (Berman & Korsten, 2010; Lai & Viering, 2012; Lubart et al., 2013; World Economic Forum, 2020). Why, then, are we continuing to emphasize knowledge and grades as ways to recognize giftedness and talent? Why are we continuing to offer special programs to only those students we identify as gifted or talented based on our imperfect instruments? Imagine the tremendous loss of talent! Changes are needed to develop the many talents needed to solve the myriad of problems that pose threats to all aspects of our lives. Changes are needed to enable students in higher education to face the challenges of an uncertain and unpredictable future!

How does our thinking need to change?

Dai and Chen (2013) described four components of paradigms that need to be consistent (Maker, 2024). Within each of these components are listed below the changes in thinking needed to prepare students for their future and to prevent the loss of talent resulting from our outmoded thinking and practices.

Definition: What is giftedness? What is talent?

- From *gifted education* for the few to *talent development* for many (Feldhusen, 1998; Paynter, 2021);
- From solving *simple problems* to solving *complex and varied* problems (Maker, 1993);
- From *knowledge* to *a rich, diverse, associative network* of ideas and concepts (Lubart, 2013).

Identification: Who is gifted? Who is Talented?

- From *identification* to *assessment* (Pease, et al., 2020);
- From *static* "Who is gifted? (identification) To *dynamic* "Who is developing what talent? Who is developing what 21st Century Skills? Who is developing a rich network of knowledge?" (assessment).

Purpose/Goal: Why are we serving them? Why is our program important?

- From the goal of *eminence* in a domain (Subotnik et al., 2011) to the goal of *development of wisdom (*Maker et al., 2023b; Sternberg, 2020);
- From talent development for *personal recognition* and gains to the *ability and willingness to use one's talents wisely to make the world a better place* (Maker, 2022).

Programs/Services: How do we serve them?

- From focus on developing *knowledge* to developing *knowledge structures* and *21st Century skills* (Maker, 2021);
- From a focus on *special programs* to a focus on *opportunities* in *inclusive settings*.

What Innovative Practices in Higher Education Result from these Changes in Thinking?

Consistent with the shift in ***definition***, a variety of talents must be recognized. Over the years of research on the Discovering Intellectual Strengths and Capabilities while Observing Varied Ethnic Responses (DISCOVER) performance assessments (Maker, 2005) and adaptation to the contexts and languages as diverse as France, Chile, Thailand, UAE (Maker et al, 2023a), the Navajo Nation, and Hispanic communities in the USA (Alfaiz et al., 2020; Bahar et al., 2020; Maker, 2005; 2020; Zimmerman et al., 2020), we have identified ten talents: Auditory, Bodily/Somatic, Emotional/Intrapersonal, Linguistic, Mathematical, Mechanical/Technical, Moral/Ethical/Spiritual, Scientific/Naturalistic, Social/Interpersonal, and Visual/Spatial. All

overlap and interact, but have distinct observable characteristics; they evolve and develop over time, from preschool through adulthood (Maker, 2021). Although some theoreticians and researchers have aligned themselves with a talent development perspective (e.g., Gagne, 1995; Subotnik, 2011), they have not made a complete shift; they do not include the 21st Century Skills, knowledge structures, and creative problem solving, essential components of all ten talents in the shift in thinking necessary for the future (Maker, 2024).

Knowing the answers to simple questions is no longer important. The ability to use knowledge to solve complex, real-world problems along with development of knowledge structures that distinguish experts from novices are essential. Experts have a highly integrated conceptual structure organized around central concepts (Bransford et al., 2000; Glaser & Chi, 1988). This rich, diverse, associative network is necessary for and facilitates creativity (Lubart et al., 2013) and maturation of the other 21st Century skills of critical thinking, collaboration, and communication, especially in transdisciplinary settings (Drake & Reid, 2021).

Assessment practices consistent with this definition ***do not include*** general measures employed in higher education: Grade Point Average (GPA); Scholastic Aptitude Test (SAT) and Graduate Record Exam (GRE); other aggregated information focused on knowledge; and teacher recommendations, which are strongly influenced by teacher beliefs (Aljughaiman & Ayoub, 2017). Researchers over the years have found that scores and grades have almost no relationship to career success (c.f., Smith & Garrison, 2005; Wallach, 1976), nor to the development of 21st Century "soft" skills (Muammar & Alhamad, 2023). Why are these instruments still in use? Because they are easy? Wallach (1976) concluded from his extensive review of research, and other researchers have concurred, that past behavior is the best predictor of future behavior. Thus, the most effective assessment is to evaluate products, performances,

and other similar evidence (Lai & Viering, 2012; Maker, 2021). Paynter (2021) gives many useful examples of developmental talent assessment using rubrics.

Portfolios are excellent ways to collect evidence: video and audio recordings of musical (*auditory*) and dance (*bodily/somatic*) performances; designs for machines and new technology *mechanical/technical*); experiments and results from science fair projects (*scientific/naturalistic*); and recordings of speeches (*linguistic*). Evidence of 21st Century skills includes what students think is (a) their most innovative solution to a problem (*creativity*); (b) an example of their most successful *collaborative* project; and (c) an example of a paper, speech, diagram, flow chart, or other method they believe is the best example of their ability to *communicate*. For problem solving, students can submit examples of the kinds of problems they enjoy solving. If a center for creativity and innovation is established (Maker et al., 2014; Maker et al., 2015), students submit products from their participation in the center.

The most effective method for ***assessing*** *knowledge structure* is concept mapping (Maker & Zimmerman, 2020; Maker et al., 2021). At all levels, and especially in higher education, including transdisciplinary concepts for mapping within academic areas and beyond will yield important information about the breadth of understanding (Drake & Reid, 2021). Detailed instructions for administering and scoring, as well as research, can be found in the articles cited. Figures 2 and 3 are examples showing high and low levels of expertise.

Figure 2. Concept map on climate change demonstrating a low level of expertise

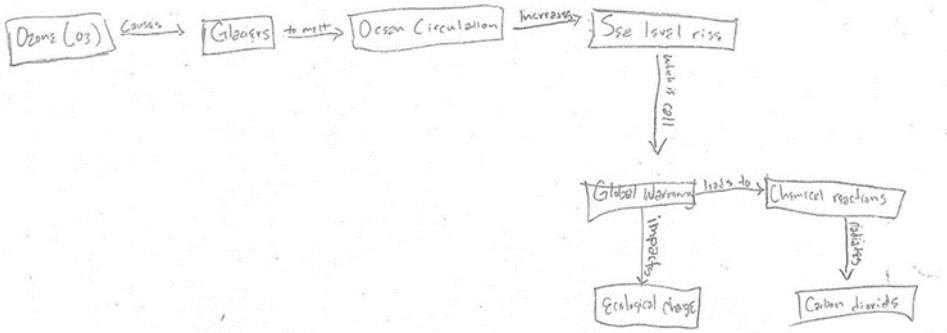
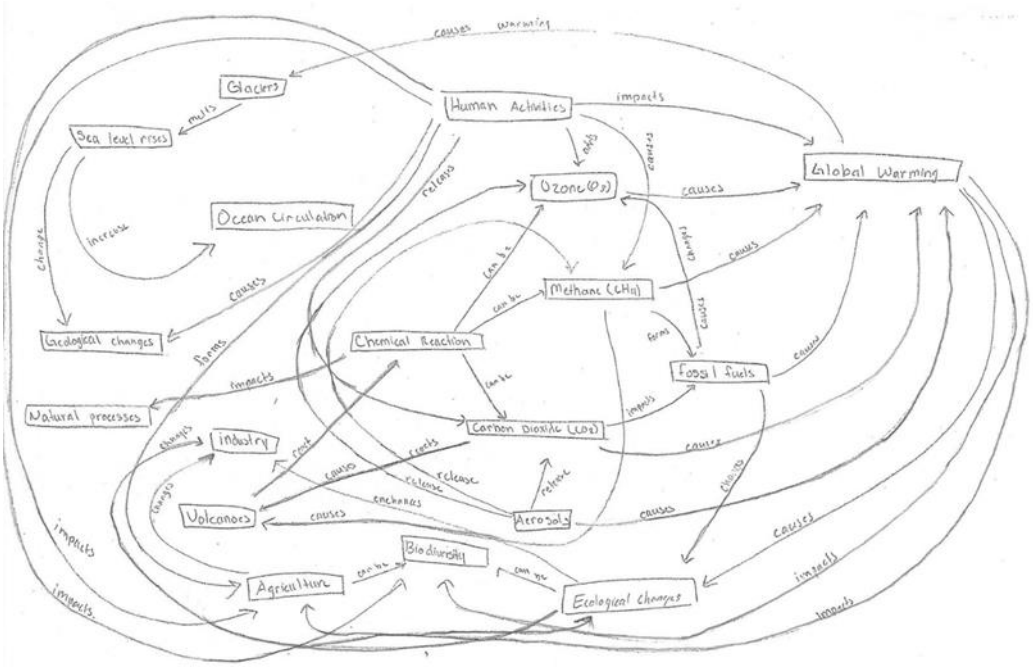


Figure 3. Concept map on climate change demonstrating a high level of expertise



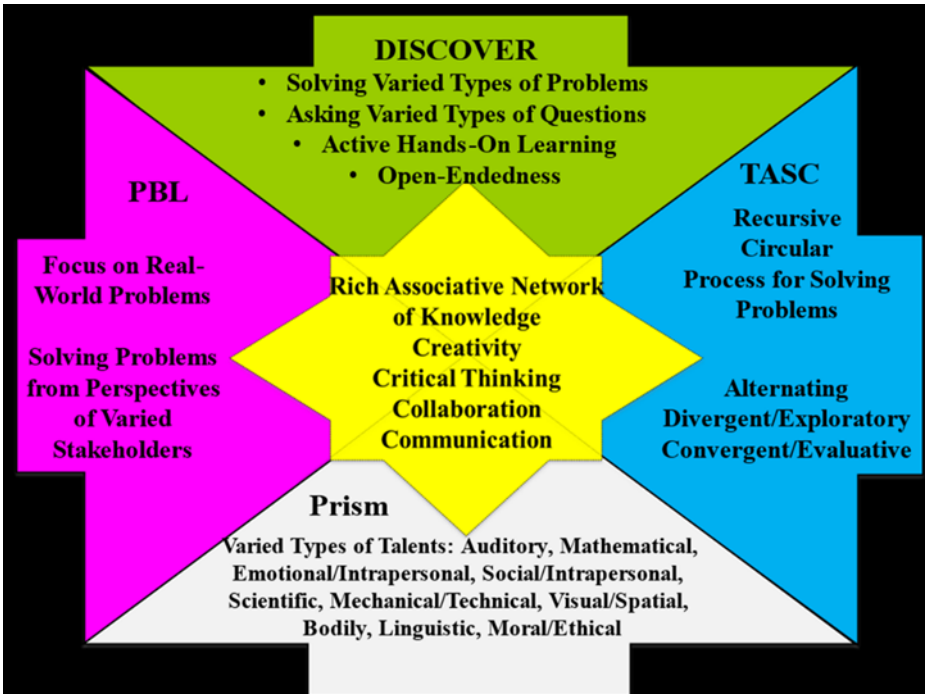
Assessment, in the needed paradigm shift, is not used for *identification*. It is used to assist students and others concerned about their development to find and choose talent development opportunities of interest. Examples of profiles and suggested opportunities are provided by Pease and colleagues (Pease et al., 2020).

The ***reasons*** for talent development need to be considered carefully and incorporated into designs of assessments, programs, and opportunities. For example, in the shift from the goal of

eminence to the goal of wisdom, ask students why they want to participate in certain opportunities. If one person says, "I want to become a well-known scientist." Then, someone else says, "I want to understand more about science so I can make the world a better place for humans and animals." If you want to develop wisdom, which one would you choose to participate in the opportunities you provide?

The ***method*** our team has found most successful to accomplish needed shifts is Real Engagement in Active Problem Solving (REAPS; Maker et al., 2023b; Pease et al., 2020) (Figure 4). REAPS is effective in developing creative problem solving in all students in math (Bahar, et al., 2021), science (Maker, et al., 2022) and development of the rich, diverse associative network of knowledge (Maker, et al., 2021), especially in classrooms in which teachers implemented it with a high degree of fidelity.

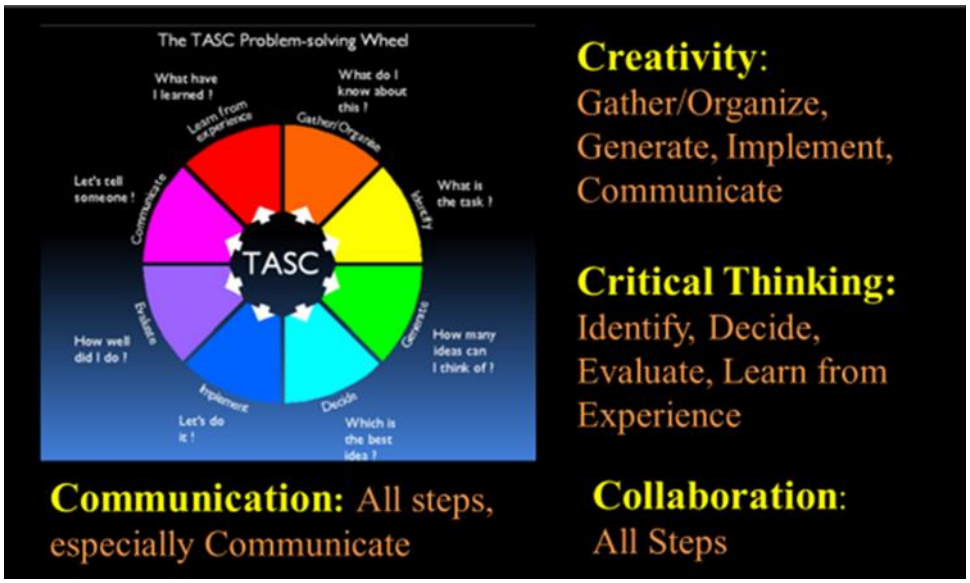
Figure 4. Real Engagement in Active Problem Solving (REAPS; Maker, 2024)



Components of REAPS that are most important in accomplishing needed shifts and the goal of wisdom include solving real-world problems creatively, placing students in diverse stakeholder

groups, providing opportunities for practicing all talents and 21st Century skills, and guiding students in using a recursive problem-solving process alternating between divergent/exploratory and convergent/evaluative thinking (Figure 5).

Figure 5. Thinking Actively in a Social Context (TASC) and 21st Century Skills



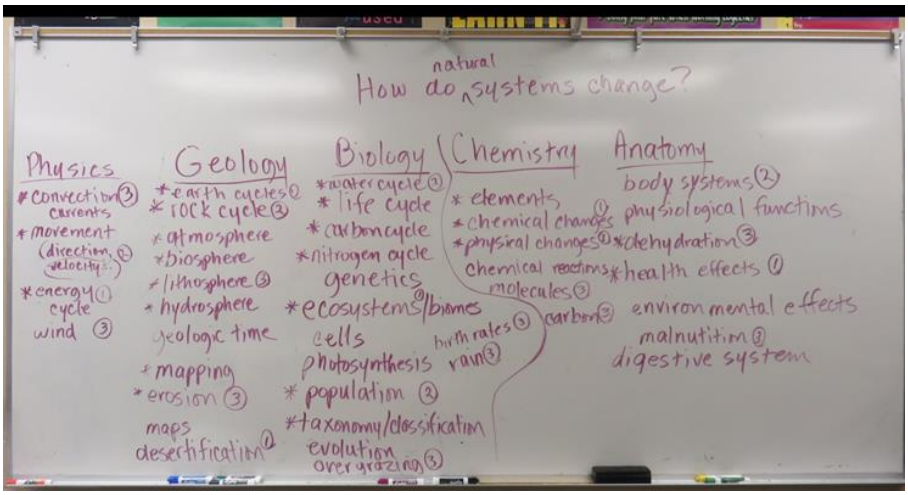
These components make REAPS effective in special summer programs (Maker, 2016), online classes (Elhoweris, 2021), multi-university programs, regular classes in many disciplines, transdisciplinary seminars for students across the university, talent integration opportunities in centers for creativity and innovation, and many other settings.

A summer program offered for students of all levels of ability at the end of high school (Maker, 2016) is an example of a transdisciplinary opportunity valuable for students in higher education. It is especially important when multiple universities and multiple countries collaborate and focus on common real-world problems such as plastic pollution, preventing pandemics, climate change, and desertification. Students can identify problems they believe are important to solve. This program is described in depth, including lesson planning, by Maker

(2016). Although the title includes "spiritual," the focus is not on religion. It is on moral/ethical/spiritual talent, aligned closely with Sternberg's (2005; 2020) definition of wisdom.

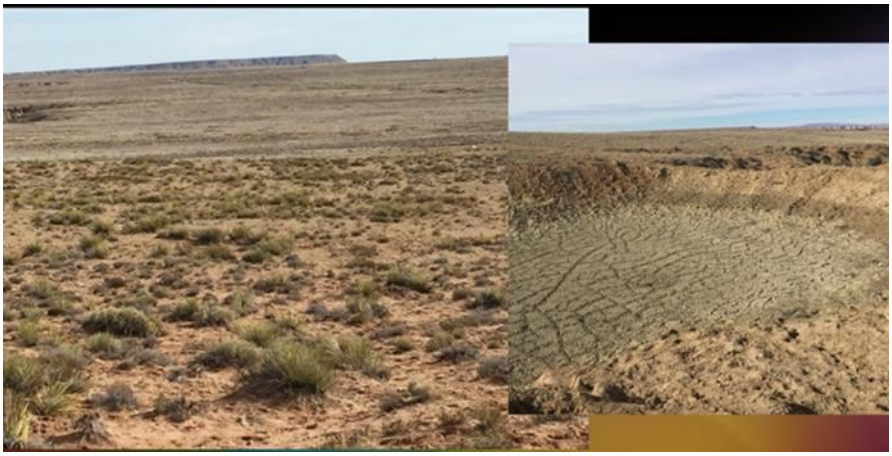
Science teachers, an ecologist, a teacher educator, and a teacher educator/researcher collaborated to select a real-world problem combining concepts from physics, geology, biology, chemistry, and anatomy with practical concerns. The question was "How do natural systems change?" (Figure 6)

Figure 6. Planning content for REAPS experience



Desertification, the process by which fertile land becomes desert, was selected because it is an expanding local problem and affects communities worldwide (Figure 7).

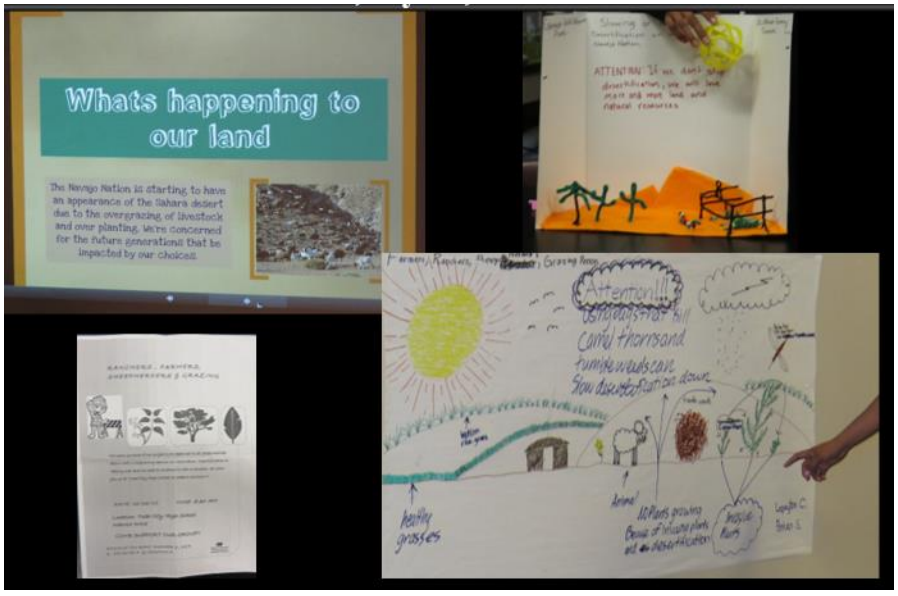
Figure 7. Desertification on the Navajo Nation



Students followed the TASC process (Figure 5). Wisdom and universal ethical principles were incorporated when students *gathered and organized* information from other people and countries (interpersonal interests), conducted experiments in the field (extrapersonal interests), participated in stakeholder groups such as the Environmental Protection Agency; Farmers, Ranchers, & Sheepherders; Local Action Community; and Grazing Committee (intra- and interpersonal interests). To *decide* which ideas were best and to *evaluate* their final solutions, they considered criteria that meet all the conditions of wisdom: "Does it "(a) Protect life now and in the future? (b) Avoid harm to people, plants, and animals? (c) Protect the earth? (d) Bring people together rather than splitting them apart? (e) Show compassion for those with different perspectives? (f) Demonstrate recognition of the connectedness between all people, the environment, and the living and non-living parts of the earth?" (Maker, 2016, p. 32)

Students' presentations during the *communication* step showed many talents and their desire to make the world a better place (Figure 8): "We're concerned for the future generations that be impacted by our choices."

Figure 8. Talents expressed through presentations, models, flyers, and murals



Finally, students reflected on learning, shared reflections, listed other problems they thought were important, and held a discussion involving all stakeholders, in which they created a solution that would satisfy interests of everyone. Some twice-exceptional and low-achieving students were recognized as talented as a result of their participation.

What Promising Practices can be Modified to Fit the Changes in Thinking?

To be a true paradigm shift, all aspects of practices need to be *consistent* with the changes advocated in each component of paradigms in the field. Here are some examples of promising practices that can be adapted to fit this new thought system.

- In an online course using REAPS (Elhoweris, 2021), the only change needed is to offer the class to all interested students, not restricted to those identified as gifted. Development of wisdom was a goal, so we are conducting research on wisdom in solutions to the problem of plastic pollution (Maker et al., in preparation).
- The online course was part of an I-Mentoring program offered by UAEU faculty (Hemdan, 2022). Although offered to gifted high school students, it is an excellent example of a talent development opportunity that can be offered to interested, motivated higher education students who submit portfolios to document their talents.
- Another example is the Mawhiba-IAU program for gifted students (Muammar & Alfaiz, 2023; Muammar & Maker, 2022). Although this program was offered only to identified high school students, it would be very appropriate for *interested* higher education students in diverse departments and from multiple universities. It was designed to prepare "… students to thrive in an innovation-based economy, by integrating the concepts of knowledge, creativity, innovation, and entrepreneurship." (p. 34) Another change would be for participants to include in their plans how the business they created would

contribute to the betterment of the world and not just make profits for the owners (Sternberg, 2005; 2020).

- Another IAU program that could be effective is the honors program described by Muammar (2022). However, it will accomplish needed shifts only if aligned more closely with Problem Based Learning, which has been used successfully in higher education for many years (Hung, 2011; Maker & Zimmerman, 2008) than with Project Based Learning and if offered as an opportunity for *interested* students from all over the university and across universities, not only to honors students.
- In New Zealand, REAPS was implemented in all beginning science classes in one high school. Local community leaders recommended focusing on ways to stop the decline in populations of a fish important in many aspects of their lives. One important outcome was that students whose talents were previously unrecognized became so engaged they were noticed and provided further talent development opportunities (Riley et al., 2017; Webber et al., 2018)

The Global Cooperative Synergy Group: A Way to Connect Passionate, Talented Problem Solvers from all Over the World

My colleagues and I invite interested higher education faculty, students, and community members to join us in the Global Cooperative Synergy (GCS) Group (https://www.globalcooperativesynergygroup.org/). "The vision of the Global Cooperative Synergy Group is to develop in young people the ability and the commitment to think globally and act locally to solve STEM and social problems through Real Engagement in Active Problem Solving (REAPS). With a base of knowledge, young people will be led to be creative and innovative entrepreneurs through collaboration not competition." Current collaborators are from

Australia, Chile, China, Mexico, Saudi Arabia, Turkey, UAE, and USA. Youth are encouraged to write blogs about their solutions to global and local problems. As one passionate student wrote, "Our story begins with a question: How can we safeguard our environment from the mounting heaps of waste that end up in landfills across the world? The stakes are high and so is our unwavering determination to find a solution." (Eman Al Shaibani, 2024, https://www.globalcooperativesynergygroup.org/blog). Let's all experience the joy of working together to make our world a better place!

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