

2006-127: EXPANDING THE USE OF EMERSON CIRCLES TO MODEL PERSONAL GROWTH IN SCIENCE AND TECHNOLOGY

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Expanding the use of Emerson Circles to model Personal Growth in Science and Technology

Introduction

In March 2004, the then Federal Reserve Chairman, Allan Greenspan speaking to the Boston College Finance Conference, said the key to preserving US jobs was not protectionism but education and training to ensure Americans thrive in a global economy. "As history clearly shows, our economy is best served by full and vigorous engagement in the global economy," Greenspan said. "Consequently, we need to increase our efforts to ensure that as many of our citizens as possible have the opportunity to capture the benefits that flow from that engagement."¹

While there are many drivers for teaching diversity competencies ranging from social equity and justice to global competition, there seems to be a broad agreement on the importance of this objective. The authors have had an abiding interest and concern in teaching diversity and developing and assessing diversity skills². Even those who understand the great benefits of diversity and passionately promote it will accede to the difficulty of moving forward with diversity issues.

Traditionally, students majoring in technical areas learn about human diversity from courses in the humanities and the social sciences. While perspectives gained in these courses are valuable, it is mostly presented without a technologically relevant perspective. Technology educators themselves need to address why the knowledge of contemporary societal and global issues are relevant to the professional development and future success of technology students. K-State at Salina faculty has begun to demonstrate their commitment to diversity by sponsoring and/or participating in events such as multicultural movies, panel discussions and external speakers³. There is a need to go beyond simply raising awareness. It is time to begin to help students develop a sense of identity as "technologist" or "scientist" that encompasses the principles of diversity and multiculturalism. Sherra Kearns, a former ASEE president, has referred to the technology professional who has gained such a sense of identity as a "socially effective whole brained global engineer"⁴. Industry demands a diversity competent employee. ABET requires students be culturally competent and be prepared to deal with globalization.

The authors have used a system of concentric circles, to construct a model of how personal and professional growth can be achieved. The authors refer to this tool as the Emerson Circle model. In 1840, Emerson wrote an essay called "Circles"⁵. In the essay, Emerson creates an image for the way growth takes place in people. He uses circles as an image of both expansion and confinement. "The life of man," he writes, "is a self-evolving circle, which forms a ring imperceptibly small, rushes on all sides outwards to new and larger circles and that without end"⁶. His idea is a picture of life long human expansion in relationships with people of different

gender, age, culture and religions. An individual's growth is linked to the growth of the society to which she or he belongs. If you were born and educated in America, there is no doubt that you will have spent some time reading Ralph Waldo Emerson. Emerson's words and philosophy could be effective in helping our students understand diversity and the value diversity skills will play in their lives. By reading his journals, the reader can also see that Emerson anticipated the globalization we are experiencing today. He knew cultural clashes could be painful and felt the only way to avoid such occurrences was through education⁷.

Emerson said "People see only what they are prepared to see"⁸. As educators, we are responsible for helping students see and be open to new concepts. This paper uses Emerson's envisioned circles to prepare our students for the brave new world.

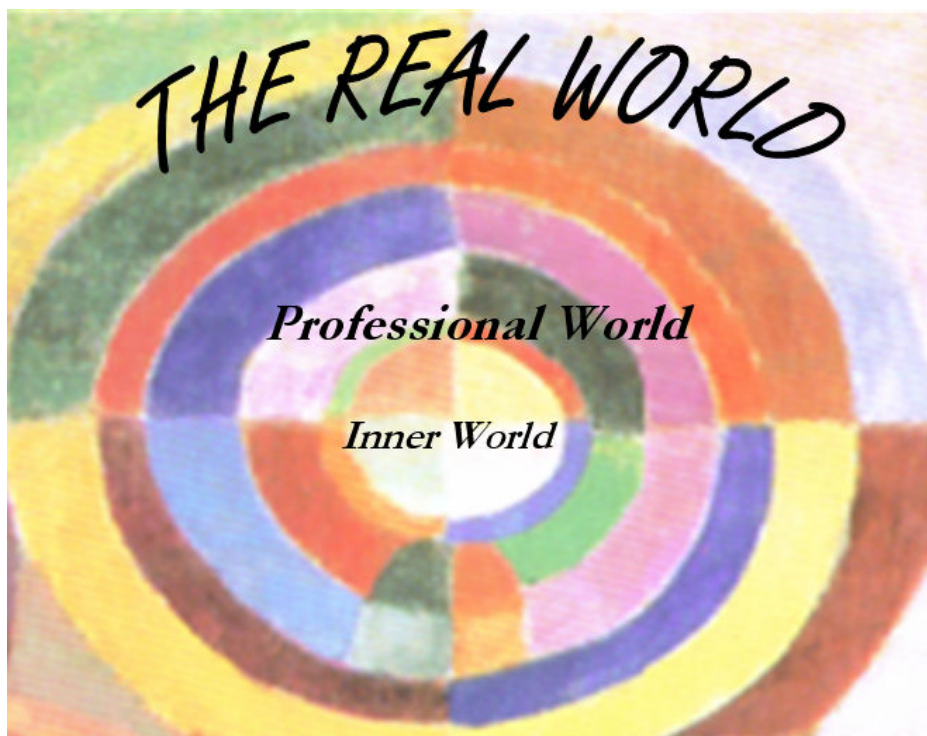


Fig. 1. Model for Growth (Background from Electric Prisms, 1914, Sonia Delaunay)

Generalized Emerson Circle Model of Growth

An Emerson Circle Model that leads an individual from her innermost world to the real world is shown in Fig. 1. This model is easily understood by studying an example of the progress of a university student as she moves to become a productive member of a community that is increasingly global. In this model, her inner world consists of all her life experiences up to the present time. This world is dynamic and forever changing. The National Academy of Engineering in the first-phase of the two-phase Engineer of 2020 project describes this world as one in the engineer "must be prepared to work in a time in which the words "minority" and "majority" are applied to different groups than they are today, a time in which what we now

consider to be engineering is more likely to be done outside the United States than inside, and perhaps, a time in which the United States is not the world's leading economic power⁹". This is quite a leap for the programs in the US to make. Our student is imbedded in an academic setting that includes an ensemble of scholars, teachers and other students. This world is considered her professional world. Making the transition from her academic environment to the real world will require a great deal of effort and preparation on her part as well as the campus community. If our student is seeking to join the global technological sector she will need the skills and competencies shown in Fig. 2. The listed diversity competencies have been derived from ABET student learning outcomes and the Kansas State University's list of diversity competencies (Tilford Competencies¹⁰). Our model of growth can be used to explain to technical educators and students alike, the need for some additional non-technical training to prepare students to succeed in the global community.

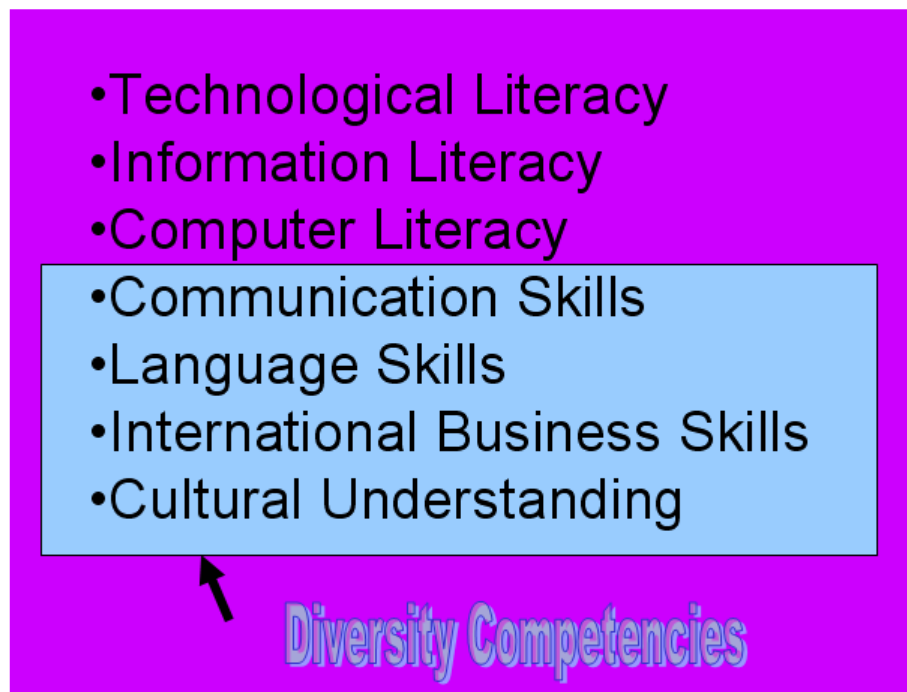


Fig. 2. Skills and Competencies for a Global Environment

An example of using Emerson Circles

Fig. 3 shows an Emerson Circle diagram of a classroom activity that connects the technical to the non-technical. The presentation linking diversity and innovation using Joel Barkers's *Wealth Innovation and Diversity* Video¹¹ was made to freshmen students in the Electronic and Computer Engineering Technology Seminar Course. The video illustrates the importance of diversity in biology, in socioeconomic thinking and in manufacturing technology. Students were then asked to write a few sentences on what they had seen (Table 1). Results reveal that a majority of the responses had noted a positive connection between technology and diversity.

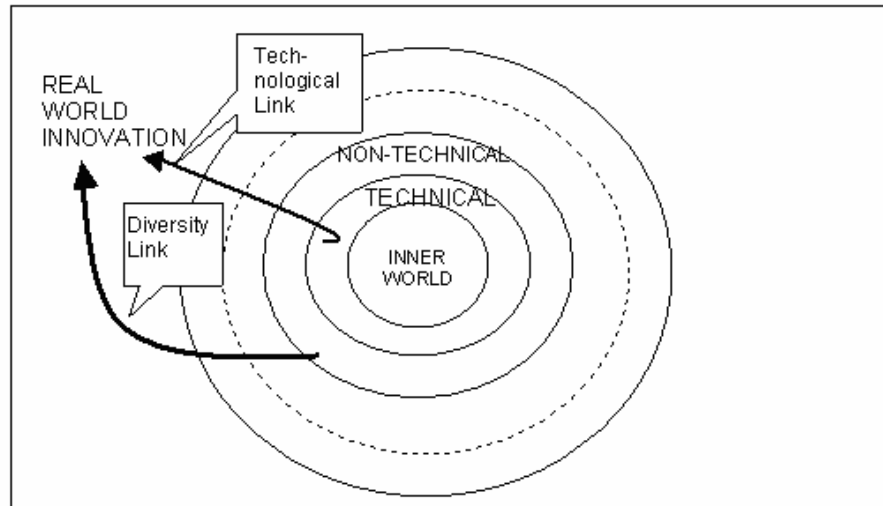


Fig.3. An Emerson Circle perspective of Joel Barker's *Wealth, Innovation and Diversity* video presentation.

<p>Multicultural Competency Development: Preparing Students to Live and Work in a Diverse World <small>Copyright © 2001 Kansas State University. All Rights Reserved.</small></p> <p>Multicultural competency is defined as the knowledge, skills and personal attributes needed to live and work in a diverse world. Kansas State University acknowledges the importance of helping students develop these multicultural competencies. In 2000-2001 the Tilford Group conducted focus groups with faculty and students. The following synthesis of multicultural competencies was compiled as a result of what was learned from those and subsequent discussions.</p>
<p>I. Knowledge -- Awareness and understanding needed to live and work in a diverse world.</p> <p>Cultural Self -- The ability to understand one's ethnic identity and how it influences identity development.</p> <p>Diverse Ethnic Groups -- Knowledge of diverse ethnic groups and their cultures.</p> <p>Social/Political/Economic/Historical Frameworks -- Awareness of how social, political, economic and historical issues impact race and ethnic relations in the world.</p> <p>Changing Demographics -- Understanding population dynamics related to ethnic minority and majority citizens.</p> <p>Diversity Implications for Career -- Understanding how diversity impacts the academic discipline, career and professional development.</p>
<p>II. Personal Attributes -- Traits needed by those who live and work in a diverse world.</p> <p>Flexibility -- The ability to respond and adapt to new and changing situations.</p> <p>Respect -- An appreciation for those who are different from one's self.</p> <p>Empathy -- The ability to understand another person's culture by listening to and understanding their perspective.</p>
<p>III. Skills -- Behaviors and performance tasks needed to live and work in a diverse world.</p> <p>Cross Cultural Communication -- Verbal and nonverbal communication skills in interaction with those who are culturally different from one's self.</p> <p>Teamwork -- The ability to work in culturally diverse groups toward a common goal.</p> <p>Listening -- The intention and ability to attend to what others are saying.</p> <p>Conflict Resolution -- The ability to resolve cultural conflicts that occur between individuals and groups.</p> <p>Critical Thinking -- The ability to use inductive and deductive reasoning to understand diverse perspectives.</p> <p>Language Development -- The ability to speak and write more than one language.</p> <p>Leadership Development -- The ability to provide multicultural leadership.</p>

Fig. 4. Kansas State University Multicultural Competency Model.

Using the K-State Tilford Competency Model to Assess the Joel Barker Presentation

The Kansas State University multicultural competency model¹⁰ is shown in Fig. 4. After viewing the Joel Barker presentation on "Wealth and innovation," we find the areas that were touched upon by the presentation can be listed along in the following manner (as defined in the Tilford Competencies),

- Diversity Implications of Career: Understanding how diversity impacts the academic discipline (under the broad criterion of knowledge);
- Respect: An appreciation of those who are different from one's self (under broad the criterion of Personal Attributes);
- Critical Thinking: The ability to use deductive reasoning to understand diverse perspectives (under broad criterion of Skills);

Table 1 makes is an assessment of the impact of the Barker presentation (based on student reflection discussed earlier).

Tilford Competency	Related concepts from Barker presentation	Students who note such a relationship exists or students who agree with such a statement
Diversity implications of Career	A more enduring future must be built on differences, not similarities	42 %
Respect	Respect for diverse perspectives is rewarded by innovation	100%
Critical Thinking	Wealth, innovation and diversity are linked	100%

From the assessed results, it would seem all students did manage to understand two important concepts that can be related to two different diversity competencies as defined by the Tilford Competency Model. While most students did not completely see how this fits with their career objectives, the thirty minute presentation seems to have been successful. While providing the same presentation to another group of students the authors chose to follow it with a discussion rather than a write up. While documented data from the discussion format does not exist, it was our impression this too was a powerful format which generated valuable discussion with regards to diversity.

Conclusion

Although the process of identity formation may seem imprecise and esoteric, it is our contention that Emerson Circles can be used as a graphical aid to help students understand their evolving identity by showing how seemingly disconnected elements in and out of the curriculum fit together to prepare them to meet future societal obligations and leadership responsibilities. It will help the students find answers the age old question, "why do I need to know this?" Through this

model we describe the process with which students attain real world skills (in this case, diversity skills).

Emerson Circles can be used as a tool for student and faculty personal growth. While our focus has been on diversity issues related to globalization, we have little doubt that the Emerson Circles can benefit other areas. It can be used as a motivational instrument to develop student interest in areas that do not have a direct connection to science and technology. It can also be used to enhance their understanding of their emerging roles in the global marketplace. Diversity education needs to be cross-curricular. Faculty members are role models who can help students form cross-curricular circles.

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