

Opening speech for Soka Education Conference

by Bryan Penprase, Dean of Faculty, Soka University of America
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Thank you for inviting me here, and it is an honor to provide some opening words for our second day of the conference on Soka Education. I want to thank the organizers of the meeting, Mackenzie Kermoade and Ryan Nakazaki, for organizing such an excellent gathering to discuss these important topics. I also am grateful to the many coordinators, study leaders and the outreach committee for the SESRP, and thank you for all your hard work. Finally thank you to all of the visiting scholars, Soka University faculty and students for taking the time to be here for our second day of the meeting. In the plenary talk yesterday, Dr. Jaimie Cloud opened in her talk about Education for Sustainability with a discussion about Thermodynamics, and how it and science in general provide a necessary foundation for discussions about sustainability and education. Bringing in the lens of scientific analysis into such discussions is crucial, and as Dr. Cloud argued, allows us to engage on these topics on a more informed and factual basis. Science also provides an essential grounding in experience which is central to Soka Education, and gives a natural place for science in developing student learning.

Makiguchi was convinced that education itself needed to be more of a science. As he wrote, *“Positivism says that we are to take the daily realities before us in education as our working knowledge, then wield the scrupulous scalpel of the scientist to dissect out the educational theory.”* His educational theory emphasizes the interconnectedness of all of us, and in one passage Makiguchi draws on a metaphor from biology, noting that *“A society consists of various individuals, similar to living organisms, which consists of individual cells..”* and that *“all of the individuals link together to form of an organization, as parts of living organisms unite for form an entire body.”* Makiguchi described the process of learning in his *Education for Creative Living* as an “epistemological progression” which begins at sensory experiences, and then enables one to determine **truth** - as *“an objective treatment of the perceptual data so as to isolate like quantities”* while **value** connoted *“a subjective reaction to the affective quotient.. that the perceptual data is felt to exert on our being.”* (Makiguchi, p.56) This interplay between objective and subjective is central to Soka education, and is also an essential component of the dialog that is built into the curriculum and teaching here at SUA. I am especially happy that SUA is developing a new Life Science concentration and with the support of the faculty and administration we are hiring new faculty and building a new Life Science curriculum that will strengthen the already vibrant dialog here at SUA between science, social sciences, humanities and the arts in a global context.

When we discuss education and many other topics, science can not only be an important source of factual information, but also can provide inspiration as it can guide us with many useful concepts and metaphors. The topic of thermodynamics for example, mentioned yesterday during the plenary talk, can not only give us perspectives about conservation of energy, but can also provide a framework for engaging in larger issues of social and collective action.

Anyone who has worked with the complex “daily realities before us” in our human experiences of cultures and communities might first question whether such non-linear and unpredictable terrain could be described at all by simple laws of science! However in my work as an astrophysicist and

now as a Dean, I am constantly reminded of metaphors and images from science that are very helpful in describing such realities. In particular - thermodynamics as a subject explains the complex and collective behaviors of large numbers of atoms or molecules, where average values (such as Temperature, Energy and Entropy) can be used to get a handle on what would otherwise present impossible complexity. To recall the basic ideas of thermodynamics (for the few of you who may be just a bit rusty) there are three main laws, which were developed in the 19th century by chemists and physicists that include Carnot, Clasius, Josiah Willard Gibbs. The first law is:

- I. The increase in internal energy of a body is equal to the heat supplied to the body, minus the work done by the body - or “energy is never created or destroyed - but is converted into other forms”**

This basic statement of energy is a beautiful metaphor for education, and embodies the dialogic nature of education. The “energy” that binds together a teacher and student together in inquiry allows for both to exchange ideas, and perspectives, and convert what was a latent or potential form of energy (such as curiosity within a student) into an active and more visible representation (such as the empowerment a student feels in learning). In this process both teacher and students are changed as well, as they exchange ideas and convert their experience into new forms of understanding.

- II. Two initially isolated systems that are allowed to interact will eventually reach thermodynamic equilibrium, with an increase in entropy compared to their original configuration.**

This basic statement can be interpreted as a metaphor for communication. Thermodynamic equilibrium occurs when molecules of two systems are allowed to collide with each other, and these collisions exchange energy until they reach “equilibrium” which means they have the same mean kinetic energy. In a like manner, groups of people who are engaged in dialog, like these molecules, “collide” with each other as they share their viewpoints. The metaphor of thermodynamic equilibrium can be thought of as the common understanding that arises from this dialog - which leaves all of the participants changed from their original state or “temperature” as they find common ground. The third law of thermodynamics concerns entropy - a wonderful quantity to contemplate in all matters that are complex.

- III. The entropy of a system approaches a constant value as the temperature approaches absolute zero.**

In its essence, entropy is a quantity that encapsulates chaos, as well as order. Thermodynamics tells us that entropy is always increasing in the universe - which suggests that whatever forms of order we may make in our civilization - such as cities or factories, will be accompanied by disorder on larger scales, such as with our atmosphere, oceans or soil. However entropy is not always a form of disorder since the technical definition of entropy involves the “number of states available to an atom or particle.” In an educational context we might think of entropy as the new possibilities that open up to a student after learning, and the expanded range of potential paths that that student can take once “energized” by their education.

These perspectives of science, while informative and often inspiring, are also limited, however, and need to be in dialog with other ways of knowing, such as those coming from the social sciences and from the humanities. Bringing a multi-epistemological inquiry to bear upon the problems of the world gives us a more versatile and more powerful toolkit for finding truth, for bridging differences, and for creating a more sustainable and peaceful planet. The new SUA life science concentration will be developed to strengthen our awareness of the interconnectedness of humanity and nature. In strengthening our science programs at SUA we are developing a capacity to bring this powerful facet of inquiry to take its place alongside the other epistemologies from social sciences, humanities and intercultural studies. This multifaceted inquiry allows SUA to develop uniquely interdisciplinary approaches which allow for students and faculty to ask questions unbounded by disciplinary borders, and to help find ways for our planet to be more peaceful and more sustainable.

I look forward to the talks today and I know that they will further advance our awareness of new perspectives facing us in topics including experiential learning, managing disaster risks, deconstructing gender binaries, confronting global climate change and creating value and leadership in sustainable development. These perspectives will help shape how all of us as educators and students create a learning process that develops our full potentiality as people, while also helping find answers that can enable our world to reach its full potential for the peaceful and sustainable future that we all know is possible. Thank you all and I look forward to today's presentations.

References

Makiguchi, T., Bethel, D.M., and Birnbaum, A. (transl.), *Education for Creative Living: Ideas and Proposals of Tsunesaburo Makiguchi*, Ames: Iowa State Press, 1989.