

Complexity, Education, and Cultural Adaptation: The Alaska Rural Systemic Initiative

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I'm a relative newcomer to complexity, having only really starting to engage with it and its implications for education about six months ago. I ended up coming to complexity after my thesis supervisor suggested that I find a suitable theoretical framework to use in my research on learning, culture and cultural evolution in living systems. It's ended up being quite a good fit.

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Outline:

1. Biocentric Education
 - Biocentric Complexity
 - Biocultural Evolution
2. The Alaska Rural Systemic Initiative
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 - results

My presentation consists of two parts. First, I will present some of the theory I've been engaging with in my Master's thesis to get some feedback on my understanding of 'culture' as a complex adaptive system.

I'll then move on to look at the AKRSI, which is a fairly extensive educational reform strategy that is based on recognition of similarities between Western complexity theory and Indigenous knowledge systems. I think it is a relatively rare example of a long-term application of complexivist ideas in schools that has resulted in some considerable benefits for Native students in Alaska.

Biocentric Education

Aims of education:

“...must be based upon a consideration of what is already going on; upon the resources and difficulties of the situation”

(Dewey, 1916/1944, p. 104)

- In our present (global) context, long-term survival warrants serious consideration as an aim of education.
- Life is inherently valuable and a potential source of common ground for cross-cultural dialogue.

Education is frequently identified as a means for achieving the aims of social, political and economic interests.

This quote from John Dewey made me reflect a little more deeply on what education is all about.

From my perspective, as a person of mixed ethnic heritage and experience teaching and traveling internationally, the interconnected global realities of human population growth, climate change, loss of biological and cultural diversity, infectious disease, and looming energy and resource crises, warrant serious consideration of long-term survival as an aim of formal education.

In many cases cultural conflicts limit the potential for the global collaboration that is needed to resolve these issues. For me, life is also a potential source of common ground to begin talking about and attempting to address these issues.

Whether you believe that life was breathed into us by a creator or that we are the result of almost 4 billion years of evolution, both ideas satisfy the criteria for a miracle and, as such, life is something that, in my opinion at least, should be valued.

Biocentric Complexity

- emergence/self-organization- complex systems spontaneously arise through the interaction of agents without centralized control.
- nestedness- complex unities are simultaneously autonomous unities, collectives of autonomous unities, and subsystems within grander unities.
- adaptation/learning- a complex unity alters it's structure to maintain viability in dynamic contexts; complex systems embody their histories.

(Davis & Sumara, 2006)

All of this sort of begs the question 'what is life'?

Rather than providing a 'static' definition of life, I am going to try to convey a complexivist understanding of life, using three concepts that are often used to describe complex adaptive systems.

1- systems exist because of the nature of the relationships between their parts rather than a centralized control. Again, we have the idea that roughly 4 billion years ago the conditions for life to emerge on Earth were satisfied.

2- at the level of the individual, we can be considered autonomous unities, collectives of autonomous unities (e.g. bodily subsystems, cells & genes) and subsystems within grander unities (e.g. ecosystems, cultural, political, economic & social systems).

3- our culture (worldview, beliefs, values etc.) are a result of all of our previous experiences (adaptations/learning). Shifts learning from a process of Newtonian mechanics to one of evolutionary dynamics...

Biocentric Complexity

- Requires a shift in our perception of 'life' from one of *individual organisms* to that of *organisms nested in a living system*.
- From a perspective of biocentric complexity, climactic, chemical, economic, social, political and cultural systems are all nested aspects of the living system in which we are enmeshed.
- *Interdiscursivity*- "how discourses intersect, overlap and interlace" (Davis & Sumara, 2006, p. 159)

Here are a few implications of this kind of thinking ...

Life is commonly defined as individual organisms with finite lifespans that are separate from the environment.

In Capra's 'The Web of Life' he views the global issues we are presently faced with as "different facets of one single crisis, which is largely a crisis of perception" (p. 4). This shift in perspective also requires a temporal shift. It requires the ability to consider the world at multiple levels of nestedness and in multiple timeframes.

Attempts to analyze or understand this complex living system require what Davis & Sumara call an 'interdiscursive analysis'. My thesis is basically a complementary interdiscursive analysis & synthesis of discourses emanating from the study of culture, evolution and education - again looking for areas of similarity or common ground.

Biocultural Evolution

- All cultures are successful adaptations to the environments with which they are evolving.
- Evolutionary hangovers- “structures or behaviors that once were adaptive but whose positive influence on reproductive performance has declined or disappeared” (Ehrlich, 2000, p. 34).
- *The Natural Alien* (Evernden, 1985)
- *Beyond Culture* (Hall, 1976).
- Education should aim to facilitate cooperative (i.e. symbiotic) resolutions to conflicts between cultural systems.

The Alaska Rural Systemic Initiative

Central focus:

“to foster a connection between two functionally interdependent but largely disconnected systems—the indigenous knowledge systems rooted in the Native cultures that inhabit rural Alaska, and the formal education systems that have been imported to serve the rural Native communities”.

(Barnhardt & Kawagley, 2004, p. 60)

The main concept that I've arrived at from this interdiscursive analysis is 'biocultural coevolution'. The term 'biocultural' acknowledges the importance of the cultural aspect of human evolution for our past and future biological survival.

As evolutionary theory has been badly misunderstood, and subsequently misused (e.g. social Darwinism), I feel the need to address at least one evolutionary misconception. The idea of teleological (i.e. goal-oriented, progressive) evolution remains widespread, resulting in comments such as "... is the pinnacle of evolution". Evolutionary success, however, can only be measured by survival. As living systems are unquestionably complex systems, the uncertainty inherent in complex systems precludes any attempt to predict which organisms or cultures will successfully reproduce and live on into the future. Thus, all existing organisms and cultures must be considered equally successful.

There have been several books written on biocultural evolution, one of the most recent is by Paul Ehrlich. In his text he describes 'evolutionary hangovers'. An obvious example of a cultural evolutionary hangover is the use of fossil fuels for energy. While this evolutionary adaptation helped fuel the industrial revolution were successful in the past now have the potential to inflict serious damage to the living system on our planet.

In some ways, our capacity for culture itself can be considered an evolutionary hangover. To help illustrate this point I'd like to draw from ideas from a couple of anthropologists. In Evernden's 'The Natural Alien', he introduces the idea that our cultural identities have in many ways 'alienated' us from the world around us, as well as people of different cultures. In 'Beyond Culture' Hall, suggests, as I have, that the majority of conflicts that prevent badly needed collaboration are cultural conflicts. He goes on to suggest that the best way to resolve those conflicts is to get 'beyond' our cultures, in a sense, to forget or deny our cultures and the conflicts that go along with them. While I agree with Hall that most conflicts are cultural in origin, I'm not sure that getting 'beyond' our worldviews is either possible or desirable. In my view, culture is an integral aspect of our lives, part of the living system that we are coupled to. Rather than attempting to deny our cultures, I'm proposing that we need to make efforts to make 'cultural adaptations' to each another. For me, that is going to be one of the great challenges for education in the 21st century.

The idea of cultural adaptation is central to the AKRSI, which is an educational reform strategy that grew out of a collaboration between the University of Alaska-Fairbanks and The Alaska Federation of Natives.

It's purpose is "to implement a set of initiatives that systematically document the indigenous knowledge systems of Alaska Native peoples and develop pedagogical practices that appropriately integrate indigenous knowledge and ways of knowing into all aspects of the education system".

The Alaska Rural Systemic Initiative

Scope: A statewide network of 20 school districts representing 185 rural schools and ~20,000 primarily Alaska Native students (~90%).

Initiatives:

- Community-based curriculum development
- Native Educator Associations (15)
- Academy of Elders
- Standards for Culturally Responsive Schools
- Handbook for Culturally Responsive Science Curr.
- Curriculum Clearinghouse (online resource)

Pedagogical approaches:

- Place-based education
- Hands-on, inquiry based instruction

Here's a brief overview of the initiative: Many of the school reform initiatives have demonstrated the viability of introducing strategically placed community based innovations that serve as catalysts around which a new, self-organizing, integrated educational system can emerge. In addition to the fifteen Native teacher associations that were established from 1995-2005, over thirty other community-based Native organizations also emerged.

Another innovative project that was undertaken by Alaska Native educators is the 'Alaska Standards for Culturally Responsive Schools'. These cultural standards, which are meant to act as a complement to, rather than a replacement for, state standards, include standards for students, educators, curriculum, schools and communities. Not meant to 'standardize' culture, but to nurture and build upon the rich and varied cultural traditions of Alaska Native peoples. As stated in the handbook, these standards can and should be adapted to meet the needs of local school communities.

The value of these cultural standards was recognized by the World Indigenous Nations Higher Education Consortium in 2003, as they were used as the foundation on which the 'Indigenous Higher Education Accreditation System' was developed for use in evaluating Indigenous higher education programs and institutions around the world.

The Alaska Rural Systemic Initiative

Common ground: Indigenous Knowledge and Western Science

Organizing principles- universe is unified, bodies of knowledge are stable but subject to modification.

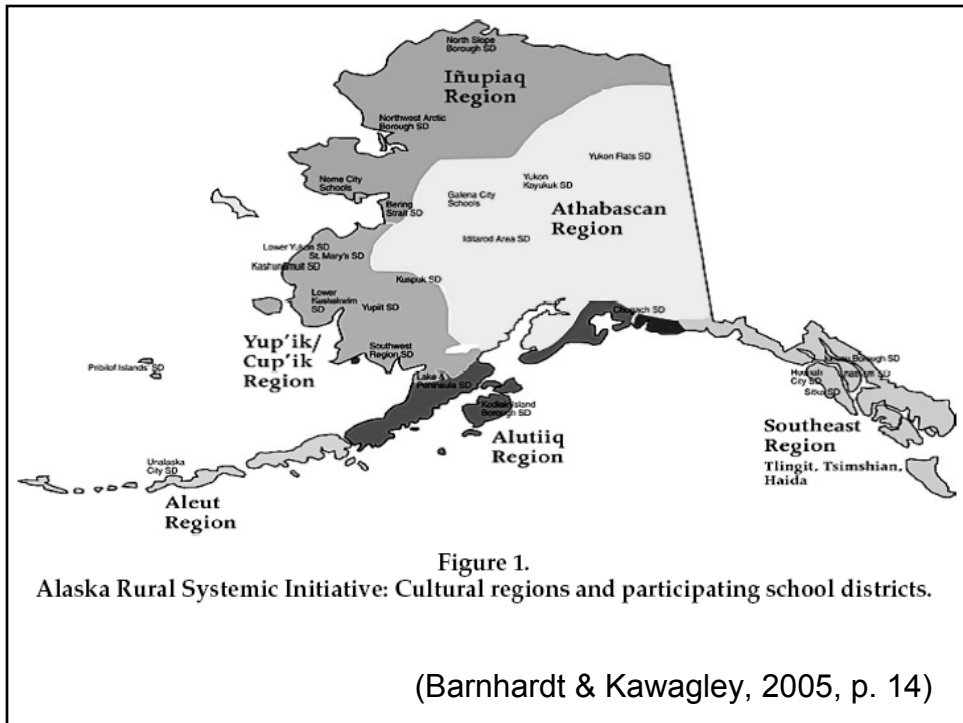
Habits of mind- honesty, inquisitiveness, open-mindedness, perseverance.

Skills and procedures- empirical observation in natural settings, pattern recognition, verification through repetition, inference and prediction.

Knowledge- plant and animal behavior, cycles, habitat needs, interdependence, properties of objects and materials, position and motion of objects, cycles and changes in earth and sky.

(Stephens, 2000, p. 16)

The Handbook for Culturally Responsive Science Curriculum is another publication that was published by AKRSI. This handbook is based on congruencies that were identified between Western scientific knowledge and traditional Indigenous knowledge systems, again the result of a complimentary interdiscursive analysis.



In addition, the educational initiatives are implemented on a rotating cycle, organized specifically for each major cultural region that makes up Alaska, so that the educational components can be adapted to fit the particular cultural context in which they are situated.

If learning and culture are adaptations to dynamic environments then attempting to teach through rigid, static curricula, makes little sense.

This aspect of the initiative echoes Bill Doll's article on curriculum and concepts of control where he describes curricula that are both flexible and stable, or in the language I'm using here, adaptive.

The Alaska Rural Systemic Initiative

Results:

“The educational reform strategy we have chosen has produced a steady decrease in student drop-out rates, an increase in the number of Native students attending college, and an increase in the number of Native students choosing to pursue studies in fields of science, math, and engineering”

(Barnhardt & Kawagley, 2004, p. 63)

In addition to these achievements, Native people in Alaska are now highly engaged in their own educational system. No longer ‘imposed’ but also emerging from Native communities.

Another important outcome is an increased recognition of the complementary nature of Native and Western knowledge, so that both can be used more effectively as a foundation for the school curriculum.

“The AKRSI has attempted to bring the two systems together in a manner that promotes a synergistic relationship such that the two previously disparate systems join to form a more comprehensive holistic system that can better serve all students, while at the same time preserving the essential integrity of each component of the larger overlapping system”.

The Alaska Rural Systemic Initiative

Potential for extension to multicultural contexts

“We have come to recognize that there is much more to be gained from further mining of the fertile ground that exists within Indigenous knowledge systems, as well as at the intersection of converging knowledge systems and worldviews”

(Barnhardt & Kawagley, 2005, p. 15)

The AKRSI provides a unique example of complexivist concepts being successfully applied in rural schools. In my PhD I intend to investigate the potential for this type of initiative to foster cultural adaptation in urban schools with a higher degree of multiculturalism. Some of the difficulties I am anticipating include documenting the cultural knowledge of all students, collaborating with community cultural organizations, and developing cultural standards.

In a brief discussion with Dr. Barnhardt, he mentioned the use of place-based education as a key element that may alleviate some of these issues. Learning about the area in which the school is situated through the local Indigenous culture may facilitate a deeper understanding of culture and cultural diversity and make links between students' understandings of their own cultures and others.

Links to Indigenous Knowledge Systems

- “For Native people, seeking *life* was the all-encompassing task” (Cajete, 2000, p. 2).
- ‘All my relations’ includes animals, plants, rocks, the entire ecosystem; all included in Mother Earth and Father Sky.
- Respect for Elders- physical embodiments of Indigenous knowledge.
- “We are the Earth becoming conscious of itself” (Cajete, 2000, p. 55).

Dr. Gregory Cajete, a Tewa Indian from Santa Clara Pueblo and a professor in Education at New Mexico University has written a book, ‘Native Science: Natural Laws of Interdependence’ that mirrors many complexivist concepts. In this text, Cajete characterizes Native peoples as ‘biophilic’, as having a natural affinity for life.

Could be critiqued as appropriation or validation by Western science...

Rather than an appropriation of Indigenous knowledge, an example of the convergence that is occurring between some aspects of ‘Western’ science and traditional Indigenous knowledge. Creating a dialogue among different cultural knowledge systems.

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