Building a Knowledge Base For and About Change

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January, 2012

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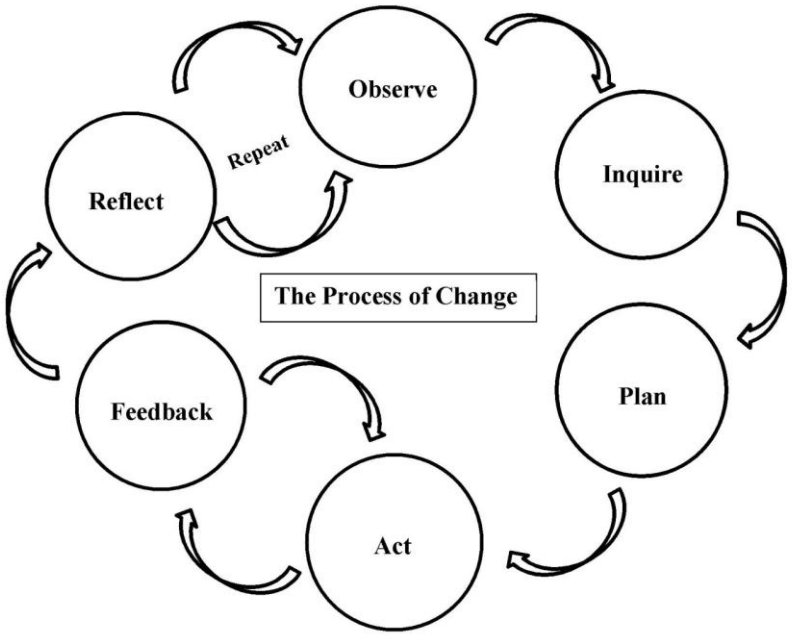
The amount and pace of change in the nineteenth and twentieth centuries resulted in an increased life span and better living conditions for millions, even billions, of people (National Intelligence Council, 2006). Unfortunately, the positive change has not resulted in all people living a better life and some people, even in wealthy countries like the United States, still live in conditions of poverty not unlike those of earlier times. Moreover, many individuals, even though they are materially better off, feel a lack of control over their lives, producing anxiety and frustration (Seligman, 2011).

Science and technology are the primary means through which these better lifestyles have been achieved, especially through providing advances in information and information exchange (Whitney-Smith, 2009). However, science and technology have not contributed equally to the development of strategies, methods, and techniques that people can use to actually take more control of their lives. While the volume of self-help books and websites has grown exponentially over the past several decades, people still express concern about the pace of change and their ability to cope with it (Fredrickson, 2009). What is needed is a process whereby decision makers (i.e., individuals, families, groups, organizations, institutions, and communities) can access science-based knowledge through a technology-driven system that they can use to guide their own change processes and change their lives.

The foundation for this process is based upon community-based action research that has been developed as a means for guiding the processes for learning and change (Keemis &

McTaggart, 2000; Stringer, 2007). One often sees the description of action research and/or change as comprising four steps: plan, act, observe, and reflect. I believe those steps are fundamental to the learning/change process, but that they need to be articulated in more detail if average decision makers are to use them to self-regulate their own change process. More specifically, the learning/change process can be mapped onto the steps describing action research. Utilizing this framework encourages people to actually begin to think like scientists as they guide and take control of their own lives. Research has shown that technology can be utilized at each step in the process to make self-regulation more efficient and effective (Kyza, Golan, Reiser, & Edelson, 2002).

Figure 1. The change process



The first step in self-regulated learning and change is to make an observation of one's life or some aspect of life, 'to look' as Stringer (2007) describes it. This first step maps well onto the steps used in the scientific method—to observe and describe so as to produce an accurate statement about reality. For decision makers involved in a self-regulated change process this

could be done through writing in a journal, completing a survey, compiling pictures or videos, soliciting opinions of friends and family, or other means for creating a rich, multifaceted representation of the important aspects of one's life. The desired outcome of this step is to create a clear and truthful depiction at the start of the change process. A wide variety of technology have already been developed to do this; what is needed is needed is a means to aggregate these so that this step a relatively easy and natural part of the decision-making process.

The next step is to engage in an inquiry about other possibilities as well as the means to make any changes in one's life, to think about what is happening and why (Stringer, 2007). It is often the case that individuals or groups will have some vague notions about present conditions, but they will lack the specific and contextual information that allows them to proceed with confidence. The purpose of this step is to inquire about not only what is factually true, but also about what is possible. I propose that a thorough inquiry of the best scientific knowledge should provide the foundation for developing possible alternatives for action. The organization of scientific knowledge should be based on a holarchical systems paradigm, recognizing that individual decision makers can be best considered as embedded agents (Bandura, 2001; Bronfenbrenner, 1979). Data should be organized from biology, psychology, sociology, anthropology as well as other relevant academic disciplines that relate to human behavior. The database would be available for general inquiry, supplemented with guided inquiry activities that would facilitate decision makers in the acquisition of a fundamental knowledge of the science-based concepts and principles that address a particular issue.

While knowledge based on application of the scientific method can produce information that is historically accurate, it might not provide enough evidence about what is possible if other circumstances were to prevail. Therefore, methods should be developed by which decision

makers can join in consultation with others to discuss the research findings as they might apply in a specific situation. A method should be developed to analyze the consultations to produce new knowledge regarding decision makers' understanding and use of scientific-based knowledge.

The third step is to develop a plan of action and the fourth step is to actually implement the plan. Stringer (2007) places these two steps together and labels them to act. However, I believe that planning and implementing need to be separated into two steps because they involve quite different processes. In the third step, then, alternatives are developed and evaluated using a wide range of criteria such as skills needed to implement the plan, the potential efficacy of particular actions, the matching of potential alternatives to specified values, the amount of time and effort needed to implement, etc. Technology would again be utilized to generate and evaluate possible alternatives and consult with others during this step. As in the previous step, methods of data analysis need to be developed to investigate how decision makers actually go about this process.

The fourth step is to actually implement the plan. Technology would be used to remind decision makers as to the steps they intended to make as well as the motivations for making those changes on a daily basis. This could be in the form of daily emails specifically targeted to the decision maker.

The fifth step is to access feedback about the implementation and effectiveness of the plan and to take any corrective action that is deemed necessary (Stringer, 2007). This step results in an iterative process whereby action is taken, immediate feedback is provided as a result of that action, slight modifications are made if necessary and the process of taking action is then continued. One of the most important and potentially valuable aspects of this approach would be

to provide technology-based methods whereby actions can recorded and analyzed, with feedback provided to the decision maker on an ongoing, continuous basis. Analysis of the data collected would contribute important knowledge regarding how feedback is actually used in the change process.

The sixth step is to periodically reflect on the process and consult with others about how successful (or unsuccessful) the change process has been up to that point (Kemmis & McTaggart, 2000). This could be done on a monthly and/or quarterly basis (depending upon the complexity of the action plan and the number of people involved). Records would be kept of the consultative process; these data could be analyzed and would contribute to further understanding of the change process.

Finally, the process is repeated over and over until one's observations of reality match one's goals and objectives (Keemis & McTaggart, 2000; Stringer, 2007). Of course, this end result is actually never achieved as meeting one's goals and objectives creates new knowledge and one observes with new understandings and wisdom. While the formal use of the technology-based program will likely be discontinued at some point, periodic follow-ups would contribute additional data regarding the change process. It is intended that the knowledge and habits developed through the involvement with the project would have a long-term impact on the self-regulation of participants' behavior.

In summary, the recommended process would organize the best information available from science regarding human learning and development and make that information available publically for inquiry and teaching purposes. Decision makers at all levels would be encouraged to make decisions and to define success using the concept of triple bottom line. That is, does the action taken

- Impact the development of personal capital—The individual develops potentials and capacities into competencies, thereby increasing the probability that the individual will be more successful in the citizenship roles of family life, work life, and community life.
- Impact the development of social capital—The use of newly developed individual competencies are integrated into group processes, thereby increasing the probability that the family, group, institution, or community will fully actualize its potential as a social entity.
- Provide for sustainable communities and societies—The changes in personal and social capital make it more likely (or at least not less likely) that future generations will have the same freedom of choice to live healthy and productive lives within their sociocultural and environmental ecologies.

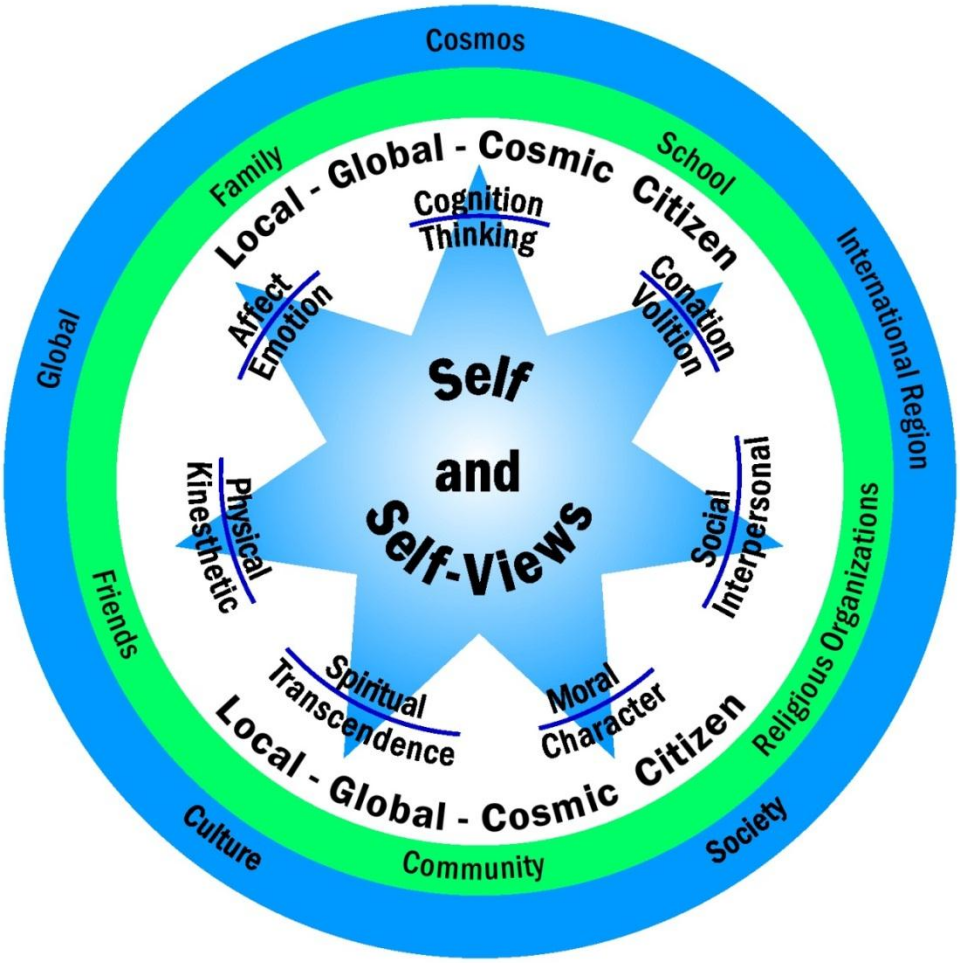
Developing The Knowledge Base

The development of a knowledge base that can be used for inquiry and guided learning activities is an essential component of the project. As described above, the primary paradigm for generating this knowledge base is a holarchical systems paradigm (Koestler, 1990; Wilber, 2007; Wilensky & Resnick, 1999). As such it takes an essentially constructivistic approach to learning and change as described in the theories of Bandura (1986), Bruner (1992), Dewey (1997), Piaget (1972, 1990), and Vygotsky (1986) as well as the humanistic theories of Maslow (1954, 1971) and Rogers (Rogers & Freiberg, 1994). It also makes extensive use of Bronfenbrenner's (1979) ecological theory of human development.

An overview of the holistic framework to be used to organize knowledge related to individuals is described by Huitt (2011). In this framework (see Figure 2) there are nine

dimensions of the individual that are relevant from the perspective of human learning and development:

Figure 2. The Brilliant Star Framework



- Self – the holistic essence of the person that can be described in terms of temperament, personality, and various self-views. When one uses terms such as thriving and flourishing to describe people, teams, families, etc. one is referring to this holistic concept (e.g., Damasio, 2010; Dweck, 2000; Swann, Chang-Schneider, & McClary, 2007).

- Cognition/Thinking – there are two aspects that are important for developing this domain. The first refers to how data is stored in memory in terms of basic facts, concepts, principles, and theories (Anderson & Krathwohl, 2001; Sternberg, 2011) . The second refers to the cognitive or intellectual processes used to acquire and process information (e.g., Costa and Kallick, 2008; Feuerstein, Rand, Hoffman, & Miller, 1980; Piaget, 1972, 1990; Sternberg, 1985, 1996).
- Affect/Emotion – there are four aspects that are the focus of this domain: (1) the comprehension and understanding of various emotions; (2) the expression and display of emotions; (3) the regulation and management of emotions; and (4) the use of affect and emotions in critical and creative thinking (e.g., Denham, 1998; Goleman, 1995; Saarni, 1999; Salovey & Mayer, 1990).
- Conation/volition – there are two aspects that are the focus of this domain: (1) self-regulation (intentionality, forethought, self-reactiveness, and self-reflection) and (2) self-motivation (develop action plans, energize to take initial action, energize to persevere). (e.g., Bandura, 1986, 2001; Dweck, 2007; Franken, 2006; Kolbe, 1990)
- Physical/health – there are two aspects that are the focus of this domain: (1) overall functioning and physical condition and (2) kinesthetic competence as seen in gross and fine motor activities (e.g., Cooper, 1999; Visser, Ashton, and Vernon, 2008).
- Social – there are two primary components for this domain: (1) social awareness and (2) social skills (e.g., Collaborative for Academic, Social, and Emotional Learning (CASEL), 2003; Goleman, 2006).
- Spiritual – the primary focus of this domain is on meaning and purpose, especially through the development of deep personal relationships with self, others, nature, and

the unknowns of the universe (e.g., Amram, 2007; Frankl, 1998; Hay & Nye, 1998; Zohar & Marshall, 2000).

- Moral Character – there are four primary components of this domain: (1) ethical sensitivity (affect), (2) ethical judgment (cognition), (3) ethical motivation (conation), and (4) ethical action (behavior) (e.g., Hauser, 2006; Kohlberg, 1984; Narvaez, 2007, 2008; Peterson & Seligman, 2004)
- Local, global, cosmic citizenship – there are four components of this domain: (1) sociocultural awareness, (2) valuing social structures, (3) preparation and competence in adult roles, and (4) active community involvement (e.g., Frey & Whitehead, 2009; Karlberg, 2008; Rifkin, 2009; Senge, 2006).

Neurology and brain science provide supporting information in each of these areas (e.g., Churchland, 2011; Damasio, 1995, 2010). Information from sociology (e.g., Giddens, Duneier, Appelbaum, & Carr, 2009), anthropology (e.g., Haviland, Prins, Walrath, & McBride, 2008), and other social sciences would be organized using a similar holistic framework. Each component of the knowledge base would have information presented at beginner (middle and high school reading levels), intermediate (lower division undergraduate reading level), and advanced levels (upper division and graduate reading levels) that would be integrated so that decision makers can move easily from one level or one domain to another. As new knowledge is added from research by others as well as that contributed by project researchers, it is intended that this knowledge base will grow ever more complex and sophisticated. The development and continuous modification of the knowledge base is one of the primary contributions of this approach to both scientific knowledge and the functioning of society at large.

Stages of Behavior Change

Previous work has shown there are at least five stages to the change process (Prochaska, Prochaska, & Johnson, 2006). The first is *pre-contemplation* at which point the potential decision maker is gathering information through observation and interaction with the world and reflecting on that information. Persons or groups at this stage would use the database rather haphazardly if they happen to come across it because of an internet search or a personal recommendation or they might use it as part of a guided learning experience provided by a teacher or instructor. The next stage is *contemplation*. At this point the potential decision maker is considering the possibility that change might be necessary, but has yet to commit to taking any action. Again, persons in this stage would use the database rather haphazardly.

The third stage is *preparation* at which point the person or group has actually become a decision maker (i.e., made a decision to make a change.) Individuals and groups at this stage would begin to systematically inquire about possible alternatives and would engage in consultation about best courses of action. The technology available through the project would facilitate the development and evaluation of possible courses of action as well as the development of an action plan. The fourth stage is *action*; at this point the decision maker is making full use of the database and accompanying technology in terms of daily consultation about the action plan, motivational emails, recording of activities, and at least weekly consideration of the efficacy of the action plan.

According to Prochasaka et al. (2006) the last stage in the change process is *maintenance*; at this point the individual or group has sustained action for at least six months and would have gone through multiple cycles while focused on the same desired outcome. For individuals who

use the project at this stage for long enough to actually benefit, it is expected that they would continue to use the materials for a variety of changes that they would like to see in their lives.

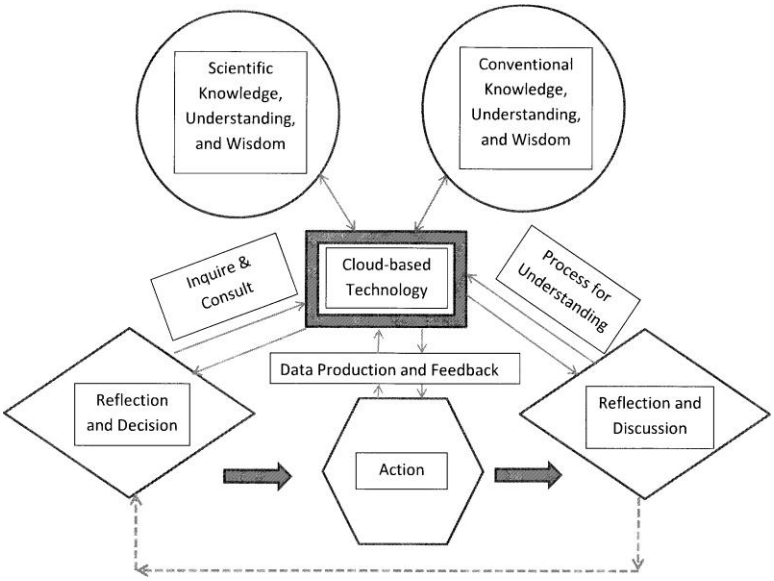
The changes made by the user can occur on at least three different levels:

1. Technical/behavioral –the user is provided with specific actions to be taken that are instrumental in solving a problem or taking advantage of an opportunity. The user would be guided to create and implement an action plan related to these specific actions. Operant conditioning would be the main learning theory applied (Huitt & Hummel, 1997; Skinner, 1953).
2. Conceptual/informational –the user is provided with learning experiences leading to new conceptual understandings that can be used to develop principles that can guide thinking and action. The user would be guided to create and critique possible alternatives and create and implement an action plan for the selected alternatives (Huitt, 2006b) .
3. Transformation/spiritual – the user is provided with learning experiences leading to the construction or creation of a new image of oneself and one's meaningful relationship to self, others, nature, and universal unknowns (Huitt, 2000; Mezirow, 1991, 1997).

Most importantly, change at a higher level must be manifested at a lower level. That is, if one claims that transformational learning has occurred, it must be manifest in thinking and behavior. Otherwise, there was no transformation. Likewise, if one claims that conceptual learning has occurred, it must be manifest in behavior. The saying, "To know and not to do is not to know" is quite applicable.

In summary, the process of change as defined by this approach actually begins when the decision maker (i.e., individual, family, group, organization, community) is in the third stage, preparation. Prior to that point, the individual or group would be considered a potential decision maker and would interact with the knowledge base, but not with the technology that would guide decision makers through the change process. As shown in Figure 3, that begins with an inquiry and consultation regarding possible alternatives and the development of an action plan. At that point the person or group would actually engage in systematic inquiry and would consult with other project participants to analyze the database as to possible best practices for the specific situation or circumstances faced by the decision maker. It is anticipated that in most cases there would be no single best practice that is accepted as the consensus approach. In that case the decision maker would use the technology to create and evaluate possible alternatives, gaining confidence in the selected alternatives through a process of consultation. The technology would also facilitate the development of an action plan that will be the blueprint for the action phase.

Figure 3. The Project-based Change Process



As the decision maker implements the action plan, data would be collected and knowledge about the efficacy of the plan would be provided. At regular weekly and monthly intervals, the decision maker would be encouraged to review progress or lack thereof and to engage in additional consultation with other project participants. Technology would also be provided to facilitate this process. The feedback provided to decision makers while they are in the action and reflection stages of self-regulated change is one of the primary benefits of this approach.

As decision makers continue their involvement, they would eventually reach the maintenance stage at which point the concentrated use of the project for the initial desired change will have served its purpose. However, it is anticipated that project participants would find the process so effective that they will continue to use it for making changes in other domains of their lives.

Working With Schools

Schools and educators should be primary partners in this approach and would be the focus of much of the work. This effort is an extension and expansion of work that I conducted for over three decades on improving classroom and school practice towards increasing student achievement (Helms, Huitt, & Graeber, 1982; Huitt, 1981, 1999; Huitt & Caldwell, 1984; Huitt, Huitt, Monetti, & Hummel, 2009; Huitt, Monetti, & Hummel, 2009; Squires, Huitt, & Segars, 1983; Traver, Fairman, & Huitt, 1982). However, improving student achievement has not been the sole focus. It has included teacher-based decision making using an innovative approach to problem solving (Huitt, 1992) and using a data-based process of lesson planning and assessment (Huitt, 2006a; Hummel & Huitt, 1994). Recent extensions include guiding teachers to become coaches for other teachers (Hummel, Wiley, Huitt, Roesch, & Richardson, 2004), encouraging

educators to be users of technology (Huitt, 2001; Huitt & Monetti, 2001), and promoting a focus on developing the whole student, including mastery of twenty-first century skills (Huitt, 2007, 2010; Huitt, Browne, Huitt, & Lawson, 2010).

It is intended that not only would participants become more competent as professional educators; they would also become more skilled in self-regulation and in using science as a core component of their decision making. Therefore, the project would work with all levels of educators in becoming more knowledgeable about science and how to use the process of inquiry so basic to the application of science. In connection with this goal, it would be necessary to organize materials that can be used in teaching what has become known as big history—the connection of human beings to the history of the universe (e.g., Abrams & Primack, 2011; Brown, 2008; Christian, 2005; Swimme & Berry, 1994; Swimme & Tucker, 2011). The focus would be on identifying or creating materials that can be used to integrate science and the application of the scientific method into the teaching of other academic disciplines (e.g., Ansberry & Morgan, 2007, 2010).

Working With Individuals and Groups, Institutions, Communities

As stated previously, this approach adopts a theoretical perspective of embedded agency, with individuals interacting with ever-increasingly complex levels of society and culture (Huitt, 2011). The basic approach of technology-supported data-based decision making would be scaled to the appropriate level depending upon the level of the decision maker (e.g., individual, family, group, classroom, school, organization, community). Emphasis would be placed on the reciprocal influence that individuals and communities have on each other as well as all levels in between. That is, institutions cannot function well without competent individuals and the

development of children and youth can be enhanced through high functioning, sustainable families, institutions, and communities.

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