

Integrated Learning in a *Science of Kriyayoga* Course

MAUREEN P. HALL, BALRAM SINGH, AMINDA J. O'HARE and EVAN G. AMES

Abstract

This study investigated changes in student self-awareness in a newly developed science course, *The Science of Kriyayoga*, which is a part of the Indic Studies minor at a medium size public university. Students enrolled in this course learned and practiced *Kriyayoga* techniques twice a week, over 15 weeks. *Kriyayoga*, a form of contemplative practice, emphasizes an anchoring and habitation in the present moment. *Kriyayoga* is based on techniques designed to accelerate spiritual development and to create a profound state of tranquility in the participants. Pedagogy for this course utilized mind and body techniques for deepened learning. Data was collected in the form of surveys and interviews with students over two iterations of the course taught by the same instructor. One main question used for this study was, "To what extent and in what ways do you understand yourself in a scientific way through this course?" Two other questions were "Who are you?" and "What/who is your ideal?" Both quantitative and qualitative data was distilled and themes emerged which represent the key points of the findings.

Key Words: Integrated Learning and Kriyayoga

"The highest education is that which does not merely give us information but makes our life in harmony with all existence."

-Rabindranath Tagore

"Mind and body are in many ways opposite from each other, and mind and body must each act according to its own principles. Nonetheless, while the mind and body are different in disposition, they are complementary opposites that form a single whole. For us to sustain mind and body harmony, and function as whole human beings, we need to discover the actual nature of the mind's characteristics." -H. E. Davey

A holistic approach to education involves fostering development in concrete knowledge and self-awareness, as emphasized above in the words of Tagore and Davey. As you will read, the findings of this article suggest that contemplative pedagogy, more specifically *Kriyayoga*, represents one viable avenue through which a harmony between mind, body, and education can be achieved.

This study investigates student understanding in a newly developed science course, *The Science of Kriyayoga*, which is a part of the Indic Studies minor at the University of Massachusetts Dartmouth, a medium size public university in the United States. This course utilizes different techniques in yoga and meditation for teaching scientific concepts; these approaches combine mind and body exercises as integral components of the pedagogy. The study documents a formative evaluation of the student learning in this course, which was a collaborative effort of a small team of researchers. Data was collected in the form of surveys and interviews with students in both the first year and the second year the course was offered. One main question used for this study was, "To what extent and in what ways do you understand yourself in a scientific way through this course?" Two other questions were "Who are you?" and "What/who is your ideal?" Both quantitative and qualitative data were distilled and themes emerged which represent the key points of the findings.

Connections to the 3rd International Festival on Yog, Culture, and Spirituality in 2012

The work of this paper fits with some of the goals of this conference. Two important goals of this conference, which are also relevant to this paper include: (1) Cultivating an understanding of the importance of Indian culture in the contemporary world, and (2) Developing a more complete understanding of the role of spiritual principles in building a better society.

In terms of the first goal above, this course highlights the connection and lack of separation between mind and body. Students in this course were taught scientific concepts through yoga and meditation, as a main part of the pedagogical approach.

The second goal involves a more thorough understanding the role of spiritual principles; this is relevant because students learned more about the nature of the self through this course. The non-dual nature of learning in this course, in other words, using the body as a learning tool, reinforces spiritual principles. Without one knowing about one's self, including mind and body, learning is incomplete. If we want to build a better society, we need to be careful not to objectify learning. Human beings are complex, and, true understanding of life involves merging mind and body. When an individual has a deeper understanding of the connections between mind and body, he or she may be able to more authentically contribute to building a better society.

Background: What is Formative Evaluation?

Robert Stake (1995), a well-known qualitative researcher, characterizes a formative evaluation in relation to food. Stake asserts, "When the cook tastes the soup, that's formative; when the guests taste the soup, that's summative." In this

collaboration the formative evaluation data facilitated the cook or the instructor tasting the soup to find out what adjustments in the flavor, temperature, and texture of the soup. In other words, this formative evaluation was conducted to assess an ongoing project (this course) during its "construction" in order to implement improvements in student learning and investigate other ways to achieve the desired learning outcomes. Stake clarifies that formative evaluations can use any of the same techniques for other kinds of evaluation; this includes data collection through surveys, interviews, experiments.

Overview of the Course

The Science of *Kriyayoga* (IST 111-01) class covers understanding of self and surrounding by individuals through first making and practicing connections between body and mind. The content of the course includes explanation of objective and practical science, and the role of the mind in creating such an important field of study. The course also covers the meaning and description of yoga, which literally means union or process of uniting.

Students who are mostly non-science and non-engineering majors are introduced to scientific approach to address a problem. This includes basic definition of science, such as science is a systemic study of a problem, subject, or system, which provides consistent results. The basic goal of scientific study is described as seeking the scientific truth, which is unfalsifiable truth. Students are made to understand that while absolute truth may not be possible its pursuit is important through self criticism, control experiments, and openness to change when new evidence is presented. More importantly, scientific pursuit invites criticism as its quality control. Ultimately, students are impressed that the key to scientific pursuit is objectivity. We must be objective to be able to make observations and

organize them systematically to derive scientific truth.

Students are introduced to basic concepts of sciences, such as nervous system, respiration, photosynthesis, physical and natural forces, atomic and molecular structure, and coordinated function of a cell. Information from these topics is then used to construct an understanding of the process of yoga, first as a practice with self, which is transformed into learning lessons for the connection with others, including animals, plants, and the environment.

The students are provided examples of holistic functioning of atoms, molecules, cells, bodies, societies, planet, and the universe.

Details of Course Procedures and Activities

The class meets two days a week, and includes learning and practicing *Kriyayoga* techniques, in addition to lecture on different topics of science and yoga philosophy.

Typically, the class begins with a brief session of meditation, breathing, or soft exercises (such as raising arms up, or bending body sideways while sitting). Students are asked to close their eyes to focus inwards. This is followed with some questions and answers or comments by students and/or the instructor. Next, there is a discussion of the subject matter that has been generally organized to alternate topics of philosophy (science or yoga) and pure science topics. This allows for connections between and among topics to be made. For example, an explanation of yoga postures (asanas) are explained after learning about the nervous system or breathing exercises are explained after a discussion about respiration and mitochondria in cells.

Students are typically assigned soft physical exercise every week, and given a chart to fill out listing their exercise observations. Additionally, students are assigned 2-3 writing

assignments. These assignments are based on articles published in popular science journals, including *American Scientist* and *Scientific American*, *Yoga Journal*, and various newspaper articles. Topics are related to an understanding of science and life, the health benefits of yoga, or controversial issues like yoga and religion. Students write critical reviews in these assignments.

Students are also taught a series of 43 standing recharging exercises, originally outlined by the Self Realization Fellowship, an organization located in Los Angeles, CA. Students are expected to learn those exercises, and are tested on them as part of their final grade.

Syllabus - Course objective, outline and tentative lecture schedules

The objective of the course is to introduce scientific concepts of modern times and relate them to scientific concepts such as yoga of ancient times, which are becoming popular in today's society. The course also aims at drawing analogy between the modern and ancient scientific thoughts.

Specific learning goals that are pursued in this course include the following:

- (a). *Understand the scientific concepts and practices using your body as an object*
- (b). *Understanding of yourself in a scientific way*
- (c). *Learning to lead a balanced life*
- (d). *Objective understanding of events and people around you.*
- (e). *Learning the truth through contemplative practice*

1. *Introduction to Science and Kriyayoga:* Definition of science, history of science, influence of science and technology in human life, branches of science, science and society. Concept of Kriya (action) and yoga (union), body and mind, matter and metaphysics.

2. *Human Nervous System*: Structure and function of brain, the basic outline of nervous system: central and peripheral nervous system, nerve-muscle junctions, neurotransmitters, hormonal control.

3. *Biological Respiration System*: Human anatomy involved in respiration, blood constituents for respiration, cellular metabolism and energy generation.

4. *Unit of biological systems*: Cell structure and function, components, role, turnover, etc. Cells of different tissues – brain, muscle, glands, sensory organs, etc.

5. *Common elements and molecules in biological systems*: Basic chemistry of carbon, hydrogen, nitrogen, sulfur, oxygen, and phosphorus. General structure of water, carbon dioxide, acids, bases, lipids, proteins, nucleic acids, membranes.

6. *Structure of matter*: Atomic theory, initial concepts of atomic structure, atomic particles and subparticles, quantum concept of atomic structure (conceptual).

7. *Forces*: Basic definition and examples of electrical, magnetic, gravitational, ionic, Vander waals, hydrophobic, hydrophilic forces.

8. *Scientific theories*: Basic concepts of kinetic theory of gases, Newtonian laws of motion, Electromagnetic theory of light, the Big Bang theory of the origin of universe conservation of matter and energy.

9. *Origin of Kriyayoga*: First description of *Kriyayoga* and its subsequent traditional lineage, scientific basis of *kriyayoga* and ashtang yoga

10. *Basic Concepts of Kriyayoga*: Fundamental assumptions of *kriyayoga*, interconnectedness of human with infinite, basic concepts of *kriyayoga* practice.

11. *Basic elements of life*: 24 yogic elements of life, nutritions for body and mind.

12. *Kriyayoga and Health*: Concept of health, health and modern medicine, health with kriya.

13. *Basic Practice of Kriyayoga*: a combination of

body, mind, sound, and light (no instruments needed) practices of *kriyayoga*.

There are several strands or streams of knowledge that inform this work. *Contemplative practice* informs this study as its focus is on the present moment. Contemplative practice refers to a range of activities that emphasizes a grounding and habitation in the present moment. It attempts to integrate all aspects of cognitive and affective learning, taking advantage of how learners respond and come to understand concepts, ideas, and experiences. *Mindfulness*, as part of contemplative practice, means finding ways to be present and alive in the moment instead of always planning for the future or lingering in the past. In this course, the practice of mindfulness (through meditation and yoga exercises) was designed to help students “pay attention” to their lives.

As Arthur Zajonc (2006), a leader in contemplative pedagogy, points out: *We are well-practiced at educating the mind for critical reasoning, critical writing, and critical speaking, as well as for scientific and quantitative analysis. But is this sufficient? In a world beset with conflicts, internal as well as external, isn't it of equal if not greater importance to balance the sharpening of our intellects with the systematic cultivation of our hearts? Do not the issues of social justice, the environment, and peace education all demand greater attention and a more central place in our universities and colleges? Yes, certainly...* (p. 2)

Educational practices and goals for student learning must be broadened, as Zajonc points out, to meet the challenges of our world and what it means to be and act as a healthy human being. Learning spaces that privilege cognitive learning only and turn away from any affective parts are places where incomplete learning happens. The subject matter is

important, but the affective connections between the learner and the subject matter are also important.

Connections between mind and body in learning represent even deeper links than cognitive and affective learning connections. Miller (2006) talks about the importance of non-attachment, and how one achieves non-attachment. Miller reports that Gandhi read the *Gita* everyday of his adult life. This Hindu text espouses the importance of not “being connected to the results of our actions.” Further, if we are attached to the results of our actions, “we cannot be fully present.” (p.31) Meditation and yoga as contemplative practice that connects mind and body can help us to be aware of our attachments, and, through this awareness and understanding, to provide students with opportunities to connect their minds and bodies in present moment learning.

Research on mind-body interactions has highlighted how influential knowing about the body can influence both psychological and physical well-being. Not surprisingly, neuroimaging research has shown positive relationships between experience with contemplative practice and cortical gray matter in areas of the brain associated with somatosensation, or our own awareness of the body and its states (Desbordes, et al., 2012; Grant, et al., 2010; Ives-Deliperi, Solms & Meintjes, 2011; Lazar, et al., 2005). In addition to these findings, experience with contemplative practice is also found to be positively correlated with cortical thickness in areas of the brain associated with memory, attention, and cognitive control (Hozel, et al., 2011; Lazar, et al., 2005), as well as areas associated with emotional regulation (Luders, et al., 2009). Increases in cortical thickness in these areas suggest that individuals with experience in contemplative practice are more efficient at their related functions.

Corresponding with the neuroimaging data, experience with contemplative practice has been found to be related to more efficient processing of information, increased attention stability, increased working memory capacity and verbal fluency, and reduced distractive thoughts (Lutz, Slagter, Rawlings, Francis, Greishchar, & Davidson, 2009; Mrazek, Franklin, Tarchin Philips, Baird, & Schooler, 2013; Jain, Shapiro, Swanick, Roesch, Mills, Bell, & Schwartz, 2007; Zeida, Johnshon, Diamond, David, & Goolkasian, 2010; e.g.) Changes in anxiety, stress, depressive symptoms, rumination, immune system functioning, and pain sensitivity, frequently cited as a response to increased mindfulness, are thought to be a byproduct of the aforementioned changes in cognition (Chiesa, Calati, & Serretti, 2010.)

The associated benefits of contemplative practices, such as mindfulness meditation, may also serve to facilitate learning by reducing stress. Stress is believed to be maladaptive to learning, as it has been linked to the hindrance of information consolidation (Kuhlmann, Piel, & Wolf, 2005). Thus, through more efficient executive functioning, students may experience less stress, and consequently will have an easier time consolidating information. This is emphasized in research conducted by Hall (1999), which discovered that students randomly assigned to a concentrative meditation intervention group, demonstrated significantly higher grade point averages than a control group after a single semester. Additionally, increases in immune system functioning, also related to stress, may lessen illnesses that contribute to absences from class.

Evidence also suggests that contemplative practice is reciprocally beneficial to educators (for a review see Roeser, Skinner, Beers, & Jennings, 2012.) Research on incorporating mindfulness meditation into the professional development of

educators revealed a significant reduction in psychological symptoms, burnout, improvements in classroom organization, cognitive control, and increases in self-compassion (Flook, Goldberg, Pinger, Bonus, & Davidson, 2013; Jennings, Frank, Snowberg, Coccia, & Greenberg, 2013.) These findings suggest that stress reduction may translate into tangible benefits for an educator's sense of well-being and learning, which in turn would benefit the classroom through an improved classroom climate and teacher-student relationship (Flook et al., 2013.) Furthermore, an educator's greater sense of self-awareness may foster a stronger emotional intelligence, possibly increasing the frequency of positive moods. It is suggested that the positive mood of the educator would also transfer to the students, which may also enhance learning outcomes (Culham & Bai, 2011.)

METHOD

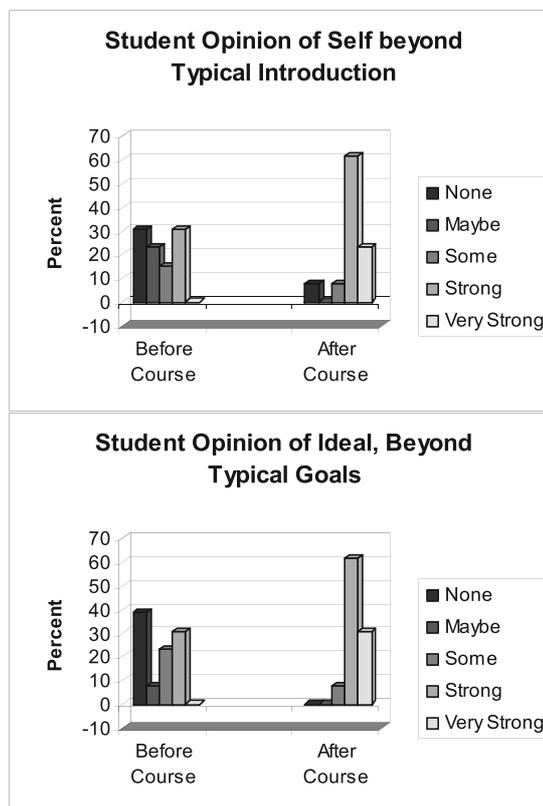
Data was collected from students in class over the course of two semesters, over a two-year period. Data was collected from students several times over the first semester this course was offered. The main question for this data collection was "To what extent and in what ways do you understand yourself in a scientific way through this course?" The scientist, who was the instructor of the course, also collected data from students. His questions included, "Who are you?" and "What/who is your ideal?" Formative evaluation data was also collected through individual interviews with students in the *Science of Kriyayoga* course.

RESULTS

Scientist's Data: We have examined the impact of the course, analyzed the data, and represented it in the following quantitative charts. It is important to note that this data was collected at the beginning and the end of the course, both in the first year and the second year that the course was offered.

First Year Data

Student responses in the first year to these two questions, "Who are you?" and "Who/ What is your ideal?" are depicted in the following two charts.



Graph (1): Student responses in Science of Kriyayoga class to the question 'Who are you?' and 'What/who is your ideal?'

A total of 13 students participated in the survey which was carried out on the first and last day of the class. The data are analyzed by reading student responses before and after the course. The following quotes have been culled from the scientist's data collection in response to the question, "Who are you?" and "What/ who is your ideal?"

One student wrote at the end of the course, *I am a body and mind that is made up of sophisticated intricate systems which make me capable of thought and feeling which are all ultimately controlled by my brain and sent out through my spinal cord.*

This passage characterizes one student's understanding of the scientific processes going on in the body. This is an example of data that appears in the Graph 1 as "very strong." There were thirteen students who participated in the first year of the course and this data is depicted in the first chart above.

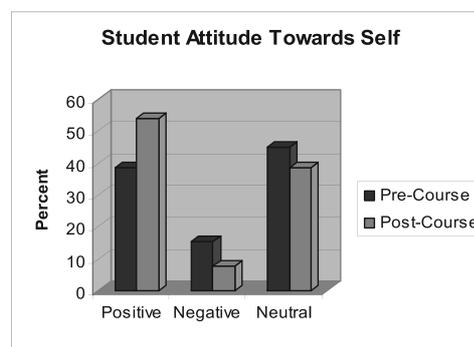
Another student wrote this in response to the "Who are you?" question at the beginning of the course and was rated as "none" in the Graph 1: *I am young Puerto Rican from Lawrence, Massachusetts. My name is xxxxx, and I am from the city.*

At the end of the course, this same student's response was: *I am god. God is a supreme being. Beings are people. Just like us. I've known I was god since high school but I was taught knowledge is power, but knowledge of self is more powerful.*

This opinion of self was rated as "very strong" in the Graph 1. It is important to note that the use of the term "god" is not a direct reference to a religious god, but instead to a powerful understanding of self. There is a shift in the way in which this student values learning. Instead of conceptualizing "knowledge" as something outside of one's self, this student realized the power and potential of his own mind and body as learning tools.

Second Year Data

The questions asked in this iteration of the course were updated. The "Who are you?" question was rephrased to, "Please introduce yourself objectively. You can assume your high school guidance counselor to be your audience." The reason for this rephrasing of the question was to focus more on objectivity and also to define an audience for students. This was done to assure a more uniformed focus across student responses.



Graph (2): Objective attitude of students towards self before and after the Science of Kriyayoga course.

Interestingly, there were also thirteen students enrolled when the course was evaluated for the second time when it was offered in the second year. Students were examined for their attitudes towards self and the responses were rated as "positive," "negative," or "neutral." After the course, the positive responses increased from 38.5% to 53.8 %. Negative responses went down from 15.4% to 7.6 %. Neutral responses went down from 45.1% to 38.6% (Graph 2). The data on the positive responses suggests that the yoga and meditation exercises enhance students' understanding of self. This data can be understood as evidence of students' true learning of self through contemplative practice and using their bodies as objects.

An additional question was included in the second year iteration of the course. At the end of the course, students were directly asked "What basic goals were set out for this course in the beginning of the semester?" The scientist asked this open response question to check for student comprehension of the overarching goals of the course. All thirteen students articulated the goals of the course. Three sample responses to this question are as follows:

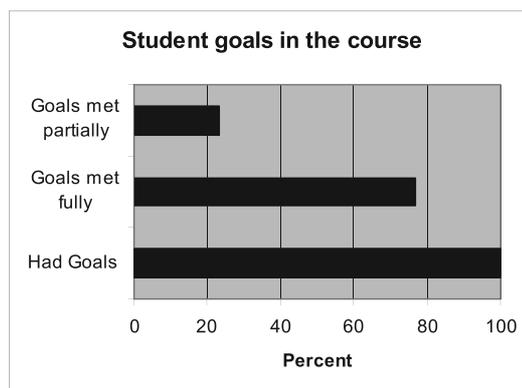
To be objective: The basic goals of the course was to view the world objectivity, and understand yoga with the scientific point of view so in turn, we can seek the truth. My main goal in this course was to learn more about yoga, as it is something I am very interested in. I hope to also learn more yoga postures.

A follow-up question was then asked, “Were those goals met from your point of view? Yes or no. Explain if the goals were/ were not met.”

The same students (in the same order as above) responded as follows

(a). Yes I know my body and my surroundings better. (b). The class overall was a good learning experience; it complimented a lot of beliefs and understandings that I have of this world. But it is up to me to seek more knowledge because teachers can only show techniques. It is for the student to practice and move beyond his teacher. (c). My main goal was most certainly met—this class was extremely informative. My second goal’s level accomplishment is more complex. I did not actually learn any more postures, but I did learn that postures were only one part of the yoga philosophy, and not as vital.

The overall response of students revealed that all the students understood or had a goal of the course to understand themselves and their environment objectively, and 78% of students felt that the goals were met fully and 22% students felt that these goals were met at least partially (Graph 3). Such a high rate of accomplishment of the course goals is a reflection of the success of utilizing contemplative pedagogy in the course and an appropriate combination of lectures, practices, and assignments designed to enhance student learning. It is particularly notable that over 90% of students were non-science and technology majors, who were able to grasp the essence of science through objective observation and systematic analysis.



Graph (3): Survey of students for the goals and their accomplishments in the Science of Kriyayoga course.

Formative Evaluation Data

Unlike the scientist’s data, the data collected for the formative evaluation was only qualitative in nature. The formative evaluation data collection involved student responses to the question, “To what extent and in what ways do you understand yourself in a scientific way through this course?” It is clear that students gained new knowledge of themselves in scientific ways, and the data was distilled into thematic areas of this new knowledge. There are three distinct themes emerging from the student data; these are 1) Body as Learning Tool, 2) Integrated Concepts of Self—Mind and Body, and 3) Interconnectedness of All Things. These three themes are evidenced by particular quotes, which have been culled from the formative evaluation data and are representative of the larger findings.

Theme One: Body as Learning Tool

One student wrote: *Just recently I have come to realize that what we perceive about ourselves is mostly subjective. Only through objectivity will be fully capable of knowing ourselves. The homework and in class exercises have taught me to observe my body in a non-discriminative manner.....I use this knowledge to overcome difficult or uncomfortable aspects within my mind and body.*

Another student wrote: *By using a systematic approach, one can gain knowledge and understanding of bodily functions, senses, mind, and soul. Exercises, tapas, meditation, and breathing are also the physical skills of gaining knowledge of yourself scientifically. In this course, this is what I have gained, and have practiced to know myself in a scientific way.*

These students gained a new understanding of science through using their bodies as a learning tool. The goals of the course were enacted through both cognitive exercises and information and through meditation exercises and yoga. The fact that the body was used as a learning tool for the course opens new areas of development for teaching and learning.

Theme Two: Integrated Conceptual Understanding of Self—Mind and Body

One student wrote: *In this course, the observance and studies of the specific topic of yoga will always be based on its mission, of using science, scientific ways, a thesis on studying our own body and mind to become in union with nature and yourself.*

Another student wrote: *This course has taught me that there are many scientific explanations for the effect meditation has on our minds and bodies.*

Another student wrote: *By doing Kriyayoga exercises, I know what my body goes through when I am in different Kriyayoga positions. For example, I've learned to connect my body with my mind by understanding what my body goes through when I am in different positions. It is not just a random position anymore, and I can connect it with my mind.*

In higher education, the focus of learning is mainly on cognitive gains in knowledge. This course allowed for a new kind of learning about science that integrated mind and body. Though we do know many things about how people learn, there is still much more to know. The *Kriyayoga* exercises in conjunction with more orthodox

teaching methods such as lecture and discussion brought about new ways of understanding and learning about science for students in this course.

Theme Three: Interconnectedness of All Things

One student wrote: *Before this course, I had a very separated relationship with myself. ...Now I have an understanding not only that I am an integral part of me. No separation...but also, that I am connected to others. Just the biological information, like how my nerves are connected to every cell in my body and they are also governed by my mind; I never gave it much thought before.*

Another student wrote: *I have also learned that everything is connected and in order to have peace within ourselves we must know how things work.*

Too often students learn about one subject without any bridges to other subjects. Science, as with all subject matters, is interdisciplinary. Teachers need to provide students with opportunities to break down the artificial “walls” that separate one discipline from another. More comprehensive and enduring learning can be the outcomes for more interdisciplinary approaches. The approach in this course is quite different from the norm of other interdisciplinary modes of teaching and learning because the exercises incorporated the body, in addition to the mind, to increase student learning.

DISCUSSION

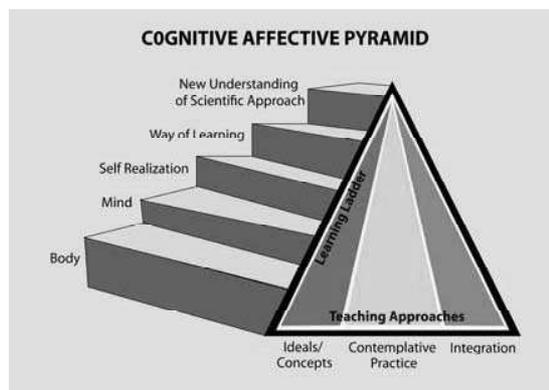
Activities that were designed for improved learning in this course can be considered contemplative practices. The Science of *Kriyayoga* was designed to integrate the mind and body in the effort to improve student learning. Though the integration of contemplative practices into education is fairly new, there is a growing body of evidence that shows the benefits of this work for student learning.

Educational practitioner Sharon Solloway (2000) explains:

Teachers who are also contemplative practitioners seek answers to perplexing questions that range from issues concerning the unpredictable nature of classroom practice and how best to prepare oneself for this unpredictability, to concerns for developing an expert teacher's capacity to "see more" of the latent possibilities in a situation than a non-expert. (p. 7)

Similarly, Jack Miller (1994) talks about how student can gain a growing sense of Inter connectedness and connection to the whole human race.

A course such as Science of *Kriyayoga* provides not only a practical experience of contemplative practice for learning a subject matter but also delves into a systematic explanation of a whole range of contemplative practices to include different aspects of yoga and meditation. It is notable that the course has been approved by the University General Education Committee at the University of Massachusetts Dartmouth to meet the science requirement of General Education for non-science majors at the university. The course utilizes contemplative practice in the service of understanding self (body and mind) in a scientific way, allowing students to use modern scientific language and knowledge to realize self in a systematic way. These steps form the first three steps of the learning ladder in a cognitive affective pyramid (CAP) we have designed (Graph 4) to put forward our hypothesis that there is a way to systematically organize different components involved in contemplative learning modules and improve learning.



Graph (4): The Hall and Singh Cognitive Affective Pyramid (2008)

The Hall and Singh CAP model is an innovative tool for assessment, which we have developed to evaluate effectiveness of contemplative practice based courses and other efforts. We expect to incorporate further developments in this field to strengthen this model for more extensive analysis.

MAUREEN P. HALL, PhD, Associate Professor, STEM Education and Teacher Development Department; BALRAM SINGH, PhD, Professor of Chemistry, Department Director, Center for Indic Studies; AMINDA J. O'HARE, PhD, Assistant Professor, Department of Psychology, EVAN G. AMES, Student Graduate, Department of Psychology; University of Massachusetts Dartmouth, USA.

REFERENCES

- Chiesa, A., Calati, R. & Serretti, A. (2011).** Does mindfulness training improve cognitive abilities? A systematic review of neuropsychological findings. *Clinical Psychology Review, 31*, 449-464.
- Davey, H. E. (2001).** *Japanese yoga: The way of dynamic meditation*. Berkeley, CA: Stone Bridge Press
- Flook, L., Goldberg, S. B., Pinger, L., Bonus, K. & Davidson, R. J. (2013).** Mindfulness for teachers: A pilot study to assess

effects on stress, burnout, and teaching efficacy. *Mind, Brain, and Education*, 7, 182-195.

Hall, P. D. (1999). The effect of meditation on the academic performance of African American college students. *Journal of Black Studies*, 29, 24-29.

Jain, S., Shapiro, S. L., Swanick, S., Roesch, S. C., Mills, P. J., Bell, I. & Schwartz, G. E. R. (2007). A randomized controlled trial of mindfulness meditation versus relaxation training: Effects on distress, positive states of mind, rumination, and distraction. *Annals of Behavioral Medicine*, 33, 11-21.

Jennings, P. A., Frank, J. L., Snowberg, K. E., Coccia, M. A. & Greenberg, M. T. (2013). Improving classroom learning environments by cultivating awareness and resilience in education (CARE): Results of a randomized controlled trial. *School Psychology Quarterly*. Advance online publication. doi: 10.1037/spq0000035.

Kuhlmann, S., Piel, M. & Wolf, O.T. (2005). Impaired memory retrieval after psychosocial stress in healthy young men. *Journal of Neuroscience*, 25, 2977-2982.

Lutz, A., Slagter, H. A., Rawlings, N. B., Francis, A. D., Greischar, L. L. & Davidson, R. J. (2009). Mental training enhances attentional stability: Neural and behavioral evidence. *The Journal of Neuroscience*, 29, 13418-13427.

Miller, J. (1994). *The contemplative practitioner: Meditation in education and the professions*. Westport, CT: Bergin & Garvey.

Mrazek, M. D., Franklin, M. S., Tarchin Philips, D., Baird, B., & Schooler, J. W. (2013). Mindfulness training improves working memory capacity and GRE performance while reducing mind wandering. *Psychological Science*, 20, 1-6.

Roeser, R. W., Skinner, E., Beers, J. & Jennings, P. A. (2012). Mindfulness training and teachers' professional development: An emerging area of research and practice. *Child Development Perspectives*, 6, 167-173.

Solloway, S. (2000). Contemplative practitioner: Presence or the project of thinking gaze differently. *Encounter: Education for Social Justice*, 13, 30-42.

Stake, R. E. (1995). *The art of case study research: Perspectives on practice*. Thousand Oaks, CA: SAGE.

Tagore, Rabindranath. (n.d.). BrainyQuote.com. Retrieved November 25, 2013, from <http://www.brainyquote.com/quotes/quotes/r/rabindrana3899999.html>.

Zajonc, A. (2006). Cognitive-affective connections in teaching and learning: The relationship between love and knowledge. *Journal of Cognitive Affective Learning*, 3, 1-9.

Zeidan, F., Johnson, S. K., Diamond, B. J., David, Z., & Goolkasian, P. (2010). Mindfulness meditation improves cognition: Evidence of brief mental training. *Consciousness and Cognition*, 19, 597-605.