Classroom Real-Life Applications of the Learning vs Quality Output

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Introduction:

Students are following along with daily expectations. However, they are not engaging in work or study that promotes synaptogenesis and appropriate pruning, and interrelations with their micro and exosystem communities, in order to have a better understanding and attitude about the macrosystems surrounding them. Students falling into this category would benefit from the extension of learning from theory to practical. By participating in a project that allows students to manoeuvre through real-life applications, students will be better able to make connections within their community and realise the importance quality output.

Goal:

The goal of this project is to increase the amount of time on task and the general quality of student work through the engagement of students in a long-term project that embeds relevant curricular and life skills.
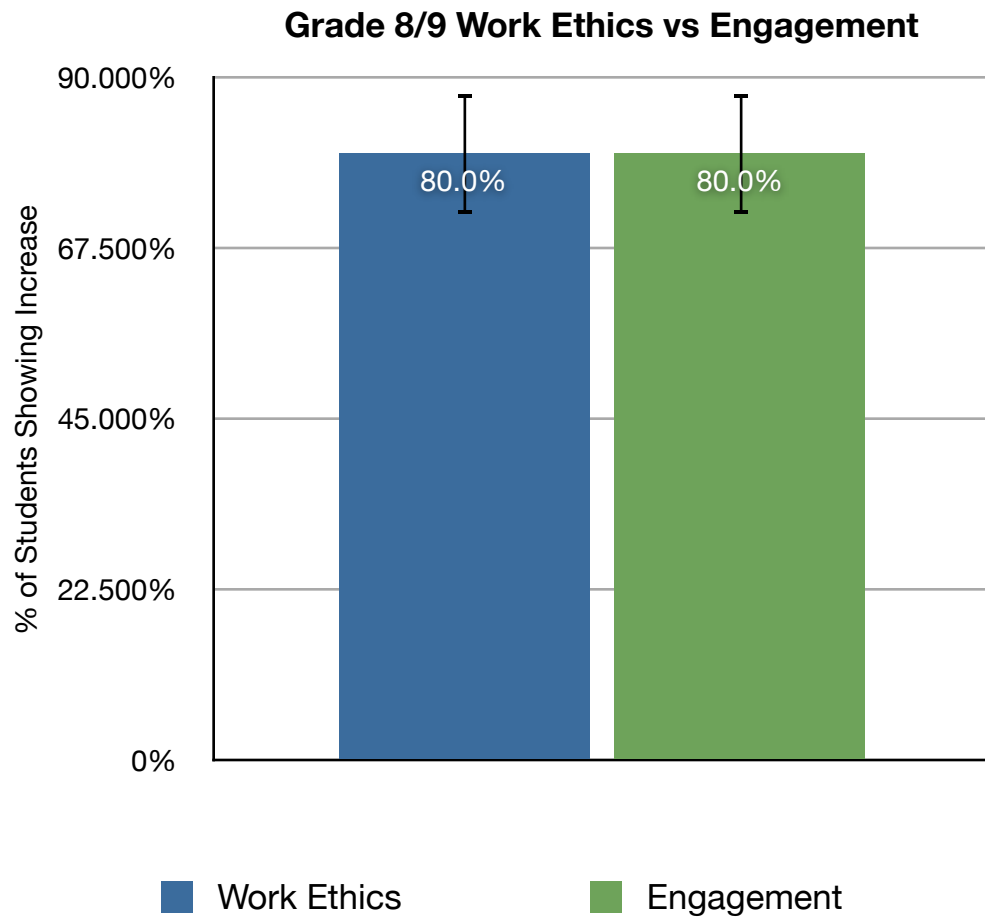
Strategies:

The production of a documentary video promoting CAPE School. Students will be required to keep a production/reflection journal.
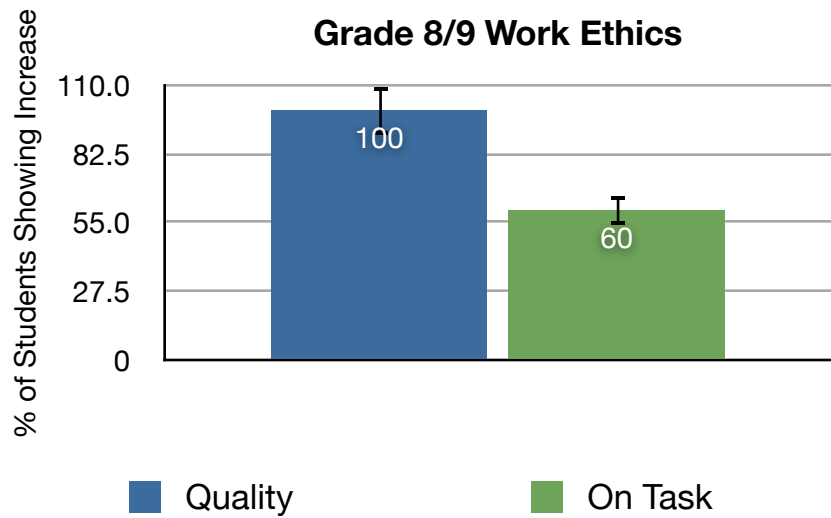
Data Collection Tools:

Tables/checklists that identify relevant skills and tasks to be completed. Engage students in the identification of relevant skills and tasks.
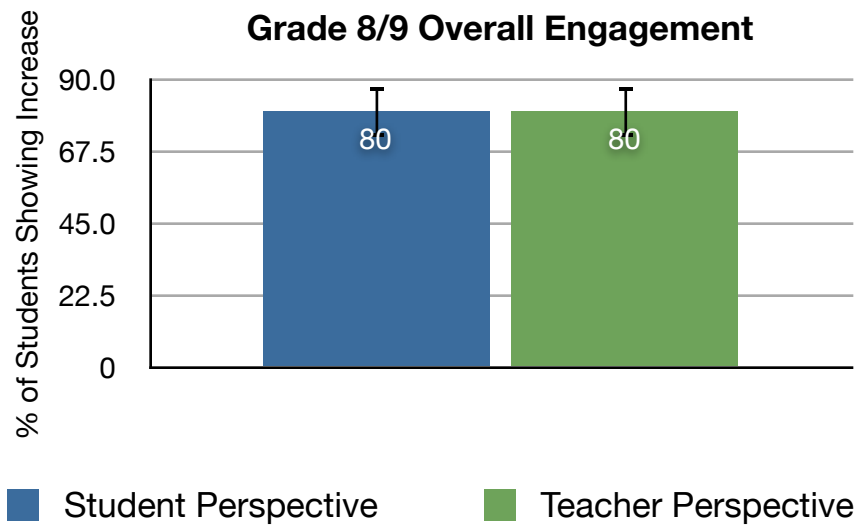Engagement checklists

Figure 1. This graph shows a very significant increase in both student work ethics and student engagement.

Grade 8/9 Work Ethics

Figure 2. This graph indicates that, though the increase in on task time was considerable, there seems to have been a much greater increase in student work quality than on task time.

Grade 8/9 Overall Engagement

Figure 3. These data indicate that engagement from the Teacher perspective is reflected in engagement from the student perspective.

Grade 8/9 Engagement

% of Students Showing Increase

Legend:
- Cognitive/Intellectual /Academic
- Social /Behavioral/Participatory
- Emotional
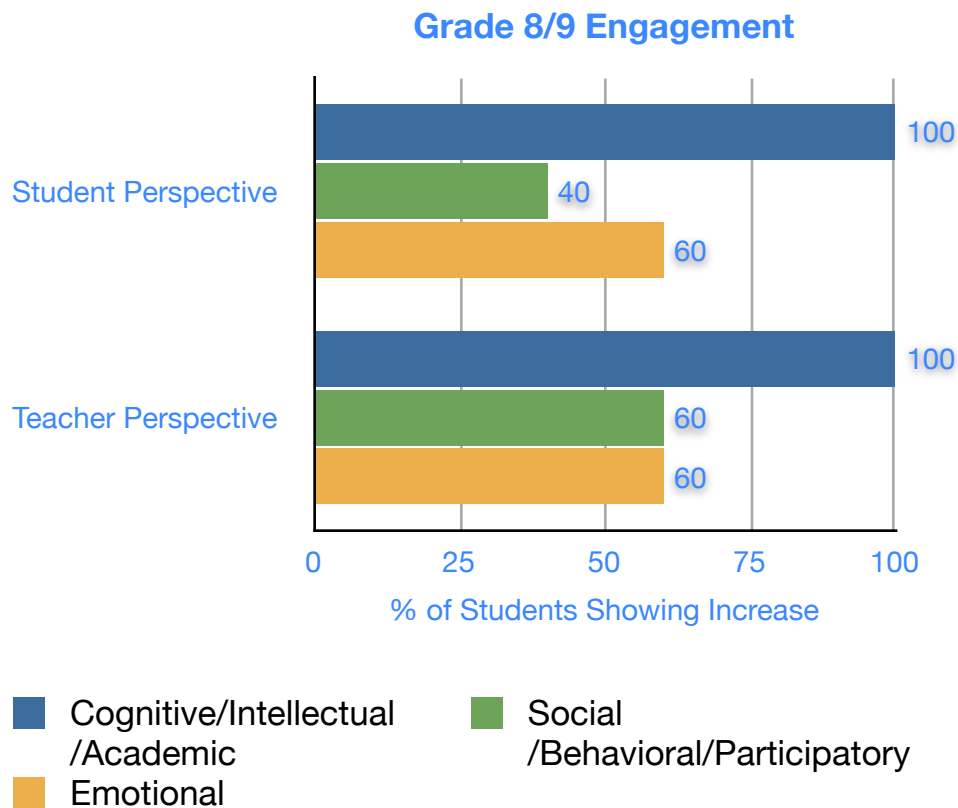
Figure 4. This figure again indicates a startling parallel between student engagement from the student perspective and the teacher perspective. It is interesting to also note the significantly lower % of students demonstrating increase in social/behavioural/ participatory engagement.

Conclusion & Discussion:
1. Involving students in an independent project with real life applications resulted in increased student engagement and significantly increased student work quality.
2. However, increase in student quality of work far surpassed the increase in on task time. It seems, therefore, that more work needs to be done in structuring an environment that supports students' focus on task.
3. Furthermore, student perspective was lower than teacher perspective in the area of social/ behavioural/participatory engagement. This differentiation could be due to the limited teacher access to the entirety of student school life. It could also be due to students having limited

experience with the engagement rubric, self-reflection, and analysis process. One must also consider the possibility that students were over critical in their own assessment.

Future Direction:
Further work involving independent projects with real life applications is recommended to sustain and reinforce the gains made in student work ethics and student engagement.

Bibliography:

Black, J. E., et al. (1990). "Learning causes synaptogenesis, whereas motor activity causes angiogenesis, in cerebellar cortex of adult rats." Proceedings of the National Academy of Sciences **87**(14): 5568-5572.
> The role of the cerebellar cortex in motor learning was investigated by comparing the paramedian lobule of adult rats given difficult acrobatic training to that of rats that had been given extensive physical exercise or had been inactive. The paramedian lobule is activated during limb movements used in both acrobatic training and physical exercise. Acrobatic animals had greater numbers of synapses per Purkinje cell than animals from the exercise or inactive groups. No significant difference in synapse number or size between the exercised and inactive groups was found. This indicates that motor learning required of the acrobatic animals, and not repetitive use of synapses during physical exercise, generates new synapses in cerebellar cortex. In contrast, exercise animals had a greater density of blood vessels in the molecular layer than did either the acrobatic or inactive animals, suggesting that increased synaptic activity elicited compensatory angiogenesis.

Bruce-Davis, M. N. and J. M. Chancey (2012). "Connecting Students to the Real World: Developing Gifted Behaviors through Service Learning." Psychology in the Schools **49**(7): 716-723.
> Learning in today's classrooms can be disconnected from students' real world experiences. Providing students the opportunity to address real-world problems may provide avenues for students to engage in their communities while developing academic skills and knowledge. Additionally, for students whose interests are piqued by the nature of their community's problems, these activities have the potential to offer students meaningful, motivating work in a supportive environment. This article explores how providing students with interest-based service-learning opportunities may help them develop and demonstrate gifted

behaviors. In addition, methods for integrating student interests and service-learning projects are presented.

Brundiers, K., et al. (2010). "Real-World Learning Opportunities in Sustainability: From Classroom into the Real World." <u>International Journal of Sustainability in Higher Education</u> **11**(4): 308-324.

> Purpose--Academic sustainability programs aim to develop key competencies in sustainability, including problem-solving skills and the ability to collaborate successfully with experts and stakeholders. These key competencies may be most fully developed in new teaching and learning situations. The purpose of this paper is to analyze the kind of, and extent to which, these key competencies can be acquired in real-world learning opportunities. Design/methodology/approach--The paper summarizes key competencies in sustainability, identifies criteria for real-world learning opportunities in sustainability programs, and draws on dominant real-world learning models including project- and problem-based learning, service learning, and internships in communities, businesses, and governments. These components are integrated into a framework to design real-world learning opportunities. Findings--A "functional and progressive" model of real-world learning opportunities seems most conducive to introduce students (as well as faculty and community partners) to collaborative research between academic researchers and practitioners. The stepwise process combined with additional principles allows building competencies such as problem solving, linking knowledge to action, and collaborative work, while applying concepts and methods from the field of sustainability. Practical implications--The paper offers examples of real-world learning opportunities at the School of Sustainability at Arizona State University, discusses general challenges of implementation and organizational learning, and draws attention to critical success factors such as collaborative design, coordination, and integration in general introductory courses for undergraduate students. Originality/value--The paper contributes to sustainability education by clarifying how real-world learning opportunities contribute to the acquisition of key competencies in sustainability. It proposes a functional and progressive model to be integrated into the (undergraduate) curriculum and suggests strategies for its implementation. (Contains 3 figures, 1 table, and 11 notes.)

Fischer, K. W. (1987). "Relations between Brain and Cognitive Development." <u>Child Development</u> **58**(3): 623-632.

> The developmental pattern of concurrent synaptogenesis in rhesus monkeys is consistent with a straightforward model of relations between brain and cognitive development. Concurrent synaptogenesis is hypothesized to lay the primary cortical foundation for a series of developmental levels in middle infancy that have been empirically documented in both human and rhesus infants.(BN)

Kilpatrick, S., et al. (2001). <u>Social Capital: An Analytical Tool for Exploring Lifelong Learning and Community Development. CRLRA Discussion Paper</u>.
>   The possibility of using the concept of social capital as an analytical tool for exploring lifelong learning and community development was examined. The following were among the topics considered: (1) differences between definitions of the concept of social capital that are based on collective benefit and those that define social capital as a resource used for the benefit of those individuals with access to it; (2) community development and community division; (3) the role of the concept of social capital in theories of community development; (4) the role of the concept of social capital in research into community development education; and (5) social capital and social cohesion. A social capital framework for analyzing community development was proposed. The framework called for considering the following items when analyzing community development, including adult education: (1) the balance between internal and external networks; (2) the presence and diversity of brokers who are able to operationalize the bridging and linking of networks; (3) the levels of self-confidence and self-esteem of community members and skills in working together, including conflict resolution; (4) norms present in the community (especially norms of inclusion/exclusion and reciprocity); and (5) the extent to which the community of analysis has shared visions for its future. (Contains 60 references.) (MN)

Leonard, J. (2011). "Using Bronfenbrenner's Ecological Theory to Understand Community Partnerships: A Historical Case Study of One Urban High School." <u>Urban Education</u> **46**(5): 987-1010.
>   Although the value of school-community partnerships is unquestioned, the reasons for success and failure are not sufficiently understood. This mixed-methods case study examines 60 years of partnering at one urban high school, using Bronfenbrenner's ecological systems theory to better understand the effect on student development as measured by variables such as graduation, attendance, and drop-out rates. Successful partners achieve "cultural cohesion" by building collaborative relationships that encircled students, whereas failed partnerships ignore ecological theory. In contrast to conventional reform strategies that focus on curriculum and/or school structure, the author offers a cultural reform strategy that emphasizes relationships. (Contains 2 figures and 9 notes.)

Phan, H. P. and E. Australian Association for Research in (2012). A Sociocultural Perspective of Learning: Developing a New Theoretical Tenet, Australian Association for Research in Education.

Explanation pertaining to individuals' cognitive development and learning approaches is a recurring theme in the areas of education and psychology. The work of Okagaki (e.g., Okagaki, 2001; Okagaki & Frensch, 1998), for example, has provided both theoretical and empirical insights into the structuring and situational positioning of individuals within a community (e.g., the school, the family). Theoretical tenets emphasised by Uri Bronfenbrenner (1979, 1989) and Lev Vygotsky (1978), in particular, form a basis that enables us to understand how individuals acquire their knowledge from societies. Notably, differing from other theories of cognition, the emphasis here entails the social construction of knowledge and how we fit in within the different layers or systems of societies (e.g., the community). Our work within the last couple of years (Phan, 2009a, In press-2013) has entailed a similar approach, emphasizing the social process of cognition within different contexts--for example, a child interacting with his/her peers at a local preschool, or a child conversing with his/her siblings at home. The empirical evidence we obtained (Phan, 2007, 2008b) has led to a conceptualisation that supports previous theoretical tenets (Bronfenbrenner, 1979, 1989; Vygotsky, 1978). The scope of this article espouses a theoretical model that depicts an overall arching system of change. In particular, similar to previous tenets and studies (e.g., Okagaki, 2001; Vygotsky, 1978; Wertsch & Tulviste, 1992), we posit that a person's cognition may situate within three separate layers: (i) individuals' sociocultural and historical origin, (ii) the community, in general, and (iii) individualised learning and achievement obtained by the individual. Our conceptualisation, for continuing discussion and research discussion, details the intricacy of distinctive layers that individuals may transverse between. Pivotal to our discussion is the quest for us to explore the multi-layered system of cognition from an individual's perspective. Rather than accentuating the potency of what a community entails, our examination discusses the individual's perceptions of learning in the various layers of society. In this analysis, how does an individual's historical genesis shape his/her understanding and perceptions of meanings such as "learning", "knowledge", and "skills"? Similarly, how does an individual fit in with a family that adheres to the beliefs pertaining to collectivism (Markus & Kitayama, 1991) and filial piety (Chow & Chu, 2007)?

Phillips, J. M. (2005). From Neurons to Brainpower: Cognitive Neuroscience and Brain-Based Learning, Online Submission.
We have learned more about the brain in the past five years than the previous 100. Neuroimaging, lesion studies, and animal studies have revealed the intricate inner workings of the brain and learning. Synaptogenesis, pruning, sensitive periods, and plasticity have all become accepted concepts of cognitive neuroscience that are now being applied to education practice. The "Decade of the Brain" spawned a multitude of brain research and educational theories known

as "brain-based learning." There is now a movement toward evidence-based teaching as a result of the new information about cognitive neuroscience and education. Large-scale national and international initiatives continue to take place to research, disseminate, and apply brain science to education. Today, multi-disciplinary approaches to current educational practices are viewed as the best method to bridge cognitive neuroscience theory to educational practice.

Webb, K. D. (2011). Student Centered Homogeneous Ability Grouping: Using Bronfenbrenner's Theory of Human Development to Investigate the Ecological Factors Contributing to the Academic Achievement of High School Students in Mathematics, ProQuest LLC.

The purpose of this qualitative study was to explore the interconnectedness of the environment, human development, and the factors that influence students' academic performance in a homogeneous ability grouped mathematics classroom. The study consisted of four African American urban high school juniors, 2 male and 2 female. During the 12 week data collection period, the participants engaged in a focus group interview, photo elicited interview, and a member check interview. The interviews were recorded and later transcribed, analyzed, and coded for codes, categories, and emerging themes. In order to obtain an in-depth understanding of the interconnectedness of students enrolled in homogeneous ability grouped mathematics classes and the environmental factors that influence their academic performance, I asked the following question: (1) Using Bronfenbrenner's Ecology of Human Development, in what ways do students' microsystem, mesosystem, exosystem, and macrosystem influence their achievement in a homogeneous ability grouped mathematics class? After integrating and analyzing the data, seven themes emerged as factors influencing students' S.U.C.C.E.S.S.: (1) School Structure; (2) Un/Accountable; (3) Classmates/Peers; (4) Custodian/Caregiver; (5) Environment/Neighborhood; (6) Support; and (7) Self-Concept/Self-Perception. There are several significant associations between the individual's ecology of human development and their academic achievement in a homogeneous ability grouped mathematics class. By giving students a voice, these associations can be identified, understood, and ultimately used to create reform geared towards closing the achievement gap in mathematics. [The dissertation citations contained here are published with the permission of ProQuest LLC. Further reproduction is prohibited without permission. Copies of dissertations may be obtained by Telephone (800) 1-800-521-0600. Web page: http://www.proquest.com/en-US/products/dissertations/individuals.shtml.]