**A Synergistic Collaborative Learning Model**

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**Purpose of the Study**

With the millennial generation now in college, one must ask the question: does a more collaborative approach to instruction better raise student outcomes and increase student satisfaction? This action research paper explores the outcomes of four separate university undergraduate pedagogy classes at a mid-west university.

**A Brief Review of Relevant Literature**

As public education moves into the twenty-first century, it is critical that it pays attention to the changing trends that occur both inside and outside of the classroom. The evolving manner in which student’s communicate and gather information is of critical importance. New models of learning with this “net” generation must be explored.

The Net Generation has grown up with information technology. The aptitudes, attitudes, expectations, and learning styles of Net Gen students reflect the environment in which they were raised—one that is decidedly different from that which existed when faculty and administrators were growing up (Oblinger & Oblinger, 2005).

The Net Generation refers to students under the age of 22. These students have grown up immersed in technology from cell phones to computers (Tapscott, 2009). In addition, these individuals have developed different communication and learning styles, which are largely collaborative in nature (Oblinger & Oblinger, 2005). These changes cause us to look for new models in human learning. Once such collaborative model may be referred to as a Synergetic Collaborative Learning Model.

The implications of this inquiry leads this researcher to suggest a potentially new learning model, which will be referred to as **The Synergetic Collaborative Learning Model (SCL)** which strives to provide an expanded view of how individuals communicate, but also how they process and make meaning out those communications, thus leading to active learning. This communication process may exist at all developmental levels ranging from infant learners to mature adults. While there may be variances in the process at each stage, the mechanisms tend to remain constant.

Communication theory has generally viewed human communications as being concerned with the making of meaning and the exchange of ideas and understandings between individuals and groups. Harold Lasswell (1902-1998), a leading American political scientist and communications theorist, has been quoted as saying that communication is “who says what to whom in what channel with what effect” (Miller, Vandome, & McBrewster, 2009). While this represents a very pragmatic definition of communication, learning theorists such as John Dewey, Lev Vygotsky and Benjamin Bloom have striven to explain how individuals derive meaning from communication. The Synergetic Collaborative Learning Model is build upon four basic pillars, all of which proceed from the theoretical frameworks of Dewey, Vygotsky and Bloom.

* Learning is filtered by the affective
* Learning is a social process
* Learning is an active process
* Learning must become cognitive

**Learning is Affective**

Theorists traditionally have focused heavily on the cognitive processing that occurs during the learning process. One such theorist, Benjamin Bloom, pointed out that there are actually three domains for learning. The first of these was the cognitive and dealt with the mental processes involved in learning at various levels from basic facts to synthesis and analysis. SCL would contend that Bloom’s Affective Domain plays an equally important role in the learning process. Bloom stated that the affective domain deals with both feelings and values (Bloom, 1956). The first sub-level of this domain is receiving. Receiving refers to the act of listening and accepting something that is communicated. It is the base affective level of human interaction. When examining this interaction in a classroom the dynamics that exist between the individual student and the teacher are key. If students perceives that the communication is contrary to their belief system, it will most likely be rejected and not received. The students must see value in what is being communicated otherwise it is seen as having no meaning. How many times have educators asked a question of the class only to receive the response; what?”… Could you repeat the question?”. The student was clearly not receiving the question and most likely the information that preceded the question itself.

The student’s affective filter had blocked the information, indicating that either his or her own thoughts or daydreams were determined to be more important that the communication of the teacher.  Had the students received the communication and thus were able to answer the questions, the process would have moved to Bloom’s second affective level, responding (Bloom, 1956).  At this stage, the students have at least determined that being attentive in class is desirable and are willing to devote a small portion of their mental energy.  They have heard the questions and have responded to them.  So far, this response may give an indication that the students are, in fact, learning, but without the third affective stage of Bloom, that learning may be very short-lived.

Valuing is the affective level in which the students begin to view the information as relevant and may begin processing means to retain the information (Bloom, 1956).  The valuing stage can be very situational.  The affective motivator for this stage may in fact be the fear of failure on the exam.  In this case, if there are no other motivators beyond the exam, the information is often discarded and meaningful long-term learning is lost.

Long-term learning begins to show itself at the fourth stage of the affective domain, organization (Bloom, 1956).  At this stage, the student begins to organize the information, building upon the schema established by previous relevant knowledge.  These bonds tend to become more permanent in nature as they are integrated into the thought process of the individual.  Not only do the new elements of information become bound to old knowledge, they also become the platform upon which information may be built in the future. It is at this stage that strong feelings of belief often appear.  Even if these belief structures are faulty, they become very difficult to dislodge. As this organizational process proceeds, it will move to the final affective stage of Internalization where behavior is permanently changed.  This is where the information is fully integrated into the thinking of the individual.

In today’s educational environment of high stakes testing, this has enormous implications. One 7th grade student was once heard to say:

*Mr. Smith, if we pass this exam, will we still have school on Monday? If we fail this exam, will we still have school on Monday? Then, why should I care one way or another? Makes no difference to me.*

What the student has demonstrated is that the affective domain is blocking any perception of usefulness or relevance for the student. Under such circumstances, the student can expect to perform at a level that is less than optimal.

**The Big “So What”**

As an educator begins to develop the lesson objectives, it is critical that they ask themselves the steering question, So What? Not from the adult perspective, but rather, from the perspective of their students. When the questions is reframed in this context, if the teacher can not provide a reasonable answer, then they must ask themselves, why will the students care? So that instruction may not only penetrate the students’ affective filter, the learners must see a direct reason for learning the information. They must see value beyond the test at the end of the unit.

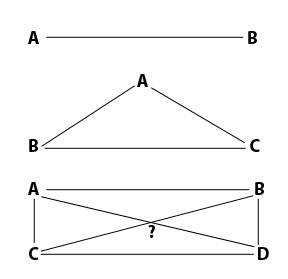
**Learning is Social and Active**

Vygotsky stated that learning is a social activity.  He even went so far as to say that very little learning could take place without social interactions.  Modeling and imitation were key elements in how individuals learn and process information.  Dewey, on the other hand, insisted that learning must be relevant and active.  He believed that people learned best by doing.  As such, the individuals created meaning (relevance) from their activities.

Finally, Benjamin Bloom created his taxonomy of learning which is broken down into the cognitive, affective and psycho-motor domains.  Each domain speaks of a series of processes, which are often presented as separate from each other.  The cognitive processes deal with thinking and analysis, the affective with feelings and values and finally, the psycho-motor with those learning activities that are tactile in nature.  Elements that are often overlooked include the inter-relationships that may exist between each of these processes.  Before the cognitive domain can be engaged, the ‘learner’ must see value in what is to be learned.  This relates to the affective domain.  Dewey used the term relevance in relation to this affective process.  Vygotsky would contend that the affective process is either enhanced or diminished (reinforced or extinguished) as a result of the perceived negative or positive nature of the interactions.

**Synergetic Communication**

Now we come to the core of SCL. Each communication or interaction creates or extinguishes synergies (or channels of ideas and collaborative interactions).  All synergies start out as potential synergies.  The determination as to if a synergy becomes active falls within the affective perceptions of each of the participants.  For the moment let’s examine potential synergies and a phenomenon, which we will call the multiplier effect.

[](http://larrytinnerman.org/Blogs/wp-content/uploads/2010/12/SYNERGYMAP.jpg)Each line in the illustration to the left represents 2 potential synergies.  In the top illustration, where there is an interaction between person A and person B, there are two potential synergies generated.  Learning is dependent upon each parties acceptance (receiving) of the others synergy.  In the second illustration, there is an interaction between persons A, B and C.  You will notice that the synergies are not growing on a one to one basis; in fact, you will now observe six potential synergies.  In the bottom illustration involving four individuals, twelve potential synergies are generated.  Collaboration among four individuals produces our first synergistic intersection.  Each intersection has the potential of generating new synergies from the established known ones. Synergies are the building blocks of ideas, learning, cognitive and emotional growth.  Each new line represents two communication elements leading to a potential original idea or thought.  Expand this model to a very large population.

Until very recently, synergetic interactions were limited to direct personal points of contact.  Even in published materials, the points of contact were often mono-directional and producing single synergetic strands.  With the advent of interactive media, such as the World Wide Web (WWW) (appropriately named, as the Web is the network of synergies between participants) we have seen a virtual explosion of new information.  The WWW is what can be referred to as a synergistic engine.  There have been synergistic engines in the past as well, and the development of each engine expanded the knowledge base of the population immeasurably.

* Spoken Language moved to cave drawings
* Cave Pictogram’s moved to a written language (hand transcribed)
* Transcribed Language moved to Printed materials (printing press)
* Printed materials being enhanced with media (telegraph, telephone, recordings, cinema, radio and television)
* Printed materials and being enhanced by Internet 1.0 (pull/push technology)
* Internet 1.0 technology being enhanced by Internet 2.0 (interactive technology, intelligent systems)

Thus far, potential synergies have been presented.  For a synergy to become active, it must be embraced, accepted and valued.  Humans are social creatures by nature.  When a meeting lets out, most people pair up or immediately form communication groups.  An observation of how these groups form is important.  Generally, people will group with those individuals whom they have determined will most likely support their synergetic output.  If a member of a group takes a highly offensive position, communication is often discontinued and active synergies close.

With the rapid expansion of potential synergies, we should ask why much of education is still based on mono- directional, single-strand synergistic methods such as classroom lecture?  Most students, from pre-K to about grade 4 or 5 seem to love school.  School is fun (affective), school is social, cognitive growth takes place at a rapid pace and learning is usually hands-on (Active).  By the time the 5th grade is reached, a entirely cognitive approach to instruction is guided, even dictated, by the appearance of the yearly test.

Rows of Desks often replace learning stations and the learning process becomes one of memorization, practice, and rote learning.  Social interactions are deemed disruptive and discouraged and, with very few cases, hands-on learning becomes limited to numerous worksheets and irrelevant homework assignments.  By grade seven, a large portion of these students, have begun to shut down.  School is no longer a “fun” (affectively supported) place of learning.  In fact, one affect that is internalized is the fact that learning is NOT fun.  The results are failing schools (and students), escalating dropout rates and diminished levels of learning on both qualitative and quantitative levels.

**Research Questions**

1. Does student performance increase with the use of a technologically assisted collaborative instructional methodology?
2. Does a technology assisted collaborative instructional style increase student satisfaction?

**Population**

The population is composed of junior level undergraduate students in a secondary education teacher preparation program at a public university. Students were enrolled in instructional pedagogy classes offered 2007, 2008 taught in the direct instructional lecture format and 2009, 2010 in the collaborative instructional format. Participants ranged in age between 19 and 45.

N= Traditional Format ( 83) N= Collaborative Format (79)

Table 1. Sample Characteristics

|  |  |
| --- | --- |
| **Traditional Classroom**  ***(Teacher Centered)*** | **Collaborative Classroom**  ***(Student Centered)*** |
| 1. Main instructional format - lecture 2. Answers provided by instructor 3. Projects graded entirely by instructor 4. Student Personal reflections recorded weekly 5. Final unit report rubric provided and individuals worked alone on personal reports 6. Main Technologies utilized:  * PowerPoint * Blackboard (to submit assignments) * Paper Handouts | 1. Main instructional format - inquiry 2. Questions provided by instructor 3. Projects peer reviewed with revisions 4. Student Personal reflections recorded weekly 5. Final unit report rubric provided and student peer work teams established to provide ongoing feedback to members 6. Main Technologies utilized:  * Open Chat discussion board projected in front of room * Wiki’s for collaborative work * Blogs for both private and public reflections * Blackboard to submit assignments, utilize discussion forum, use collaborative group assignment spaces. |

**Method** (Mixed Method)

This action research utilized a mixed method approach when the method of instruction was determined to be the independent variable. Sample 1 consisted of four sections of students taught using a traditional lecture format while sample 2 represented four section of students taught using a technology assisted collaborative teaching model. Each class prepared a final work sample for class that was evaluated through a blind evaluation process by two independent examiners. This process is one that is consistent with the practice of assessment of final projects in this particular course. An extensive rubric was utilized in the evaluation of the process and independent scores were recorded. In no case were the examiners cognizant of delivery method. Historical data was used in this case spanning a period of 8 consecutive semesters. The instructor of record for all class samples was the same individual utilizing the two different instructional approaches. As the data was analyzed, an independent t-Test analysis was performed.

Following the quantitative analysis, a qualitative examination of student’s attitudes was performed through the examination of both aggregate personal reflection samples (which were recorded by students as part of their weekly journaling about the class. In addition, a comparison of SIRII data from two of the semesters was also analyzed. One other component that was examined were comments from field supervisors regarding student performance during their Early Field Experience.

**Data Sources**

1. Final Unit Report Work Sample   
   This report on the Early Field Teaching Experience is a detailed report prepared by each student. The report looks at the following aspects of both planning and execution of the field teaching unit at a middle school setting. Sample reports were examined from each class in a blind evaluation. Components from the reports which were scored by the two independent evaluators include:

* A five lesson instructional unit created in conjunction with the supervising host teacher.
* Profile of the Class (description and analysis of how classroom environment and composition impacts upon planning and teaching)
* Context of the Unit (description and analysis of how this instructional unit fits within the entire curriculum as well as examining instructional relevance)
* Goals of the Unit (description and analysis of how instructional goals and objectives relate to prescribed curricular standards based outcomes)
* Activities of the Unit (description and analysis of how each daily activity supports the stated learning objectives)
* Assessment in the Unit (description and analysis of how both formative and summative, assessment is used to evaluate student performance.)
* Evaluation and Reflection on Unit Effectiveness (description and analysis of those elements of instruction and planning which were effective and those which were less than effective utilizing the tools of assessment, daily reflective logs and defined outcomes as related to objectives including a discussion of any instructional adjustments made).

1. Personal Student Reflective Entries

* Each week, each student records reflections and observations in a personal reflection blog. Following the conclusion of each semester, these comments are stripped of identifying information and included in a data-base which is used for ongoing improvement for this class.

1. Feedback from Teaching Field Supervisors

* There were several anecdotal comments recorded by teachers and supervision regarding the effectiveness of students in the collaborative sample.

1. SIR-II Reports

* An aggregate look at the student evaluation scores were examined to provided corroborating evidence of student satisfaction.

**Results**

Table 2. Raw Scores on Unit Report

|  |  |  |
| --- | --- | --- |
|  | Traditional | Collaborative |
| N | 83.00 | 79.00 |
| Mean | 400.35 | 466.20 |
| Mode | 365.00 | 500.00 |
| Range | 215.00 | 131.00 |
| Standard Deviation | 55.69 | 47.64 |

Note: Total Points possible = 500

Table 3. Independent Groups t-Test

|  |  |  |  |
| --- | --- | --- | --- |
|  | t | p | DF |
| Lecture to Collaborative Format | 4.0180 | 0.0003 | 160 |

The results of an Independent Groups t-test analysis of the aggregate scores as recorded on the Final Unit Report between the traditional lecture format as compared to the technology enhanced collaborative format found that the were significantly different at p<.001 as seen in the table above.

Table 4. SIR-II Score Comparison

|  |  |
| --- | --- |
| Spring 2009 – Traditional Group | Fall 2009 – Collaborative Group |
| 3.92 | 4.81 |

Note: Based on 5 point scale

In addition,

An analysis of both the SIR-II scores as well as personal comments indicates an increase in overall student satisfaction with the collaborative mode of instruction. While there are specific limitations to this study including an inability to generalize due to a relatively small sample size, it does act as a pilot for future more detailed inquiry.

**Significance**

﻿Universities have traditionally been viewed as the centers of change in the field of education. At the same time, education remains as one of the most traditional of disciplines. As such, change, when it occurs in education, often comes very slowly. Meanwhile, students are becoming more socially connected due to the availability of the communication tools that can be found in the various technology-based infrastructures that occupies every waking moment of their lives.

Educators have known that people are social creatures for quite some time. The social learning theories of both Albert Bandura and Lev Vygotsky have both contended that learning is a social process (Bandura, 1977, Wertsch, 1985). Young adults today are proving that they learn and collaborate in a truly social manner when given the opportunity. This mode of learning is often underutilized in university classrooms. When used, social networking technologies can have a marked effect on what is often typically viewed as a very traditional setting.

**Implications**

In the traditional lecture classroom, the students receive information for a variety of reasons.  They happen to like the teacher, they are conditioned to attend to the lecture to perform well on the test, and they do not want to be embarrassed by not knowing the answer to a question.  In this category, you will find your “A” students.  They have been conditioned to be active listeners.  These students will also respond well to questions and often value the information simply because they value the status of the teacher.  Though routines of study, they have established a organization system to access the information, but often will end at this point as they traditionally have a very fixed set of internalized values.  While these students tend to be very successful, they also tend to become formula thinkers and often lack critical analysis skills for information that falls too far from the accepted norm.

In the case of the “C” students, often times they express boredom.  They have learned that most of what is presented in classroom lecture is transitory information at best and they will struggle to assimilate just enough information to perform at an average level on the test.  They usually have one area of interest in school, either in music, art or science, mainly because these subjects tend to be “hands on” in nature.  While most of these students will perform adequately to successfully graduate, most of the information that has been learned is soon forgotten.

Some anecdotal evidence has caused some concerns that highlight this situation. In the above education pedagogy classes I ask a series of questions each semester.  The students are college juniors and are preparing to be future teachers.  In the first case, I ask that the social studies and history majors refrain from answering or helping.    
  
The first question…  Who is the vice president of the United States?  The best response I have received in four years is 46%.    
  
The next question… Please name the three branches of the US government?  In this case, only 5% of the students were able to answer correctly.  I then tell them the answer to the previous question and ask… Which branch of the government is responsible for budgets and spending?  In this case, in four years, I have only had ONE student get the answer correct!

Now we move to the second set of questions… I ask the math majors to refrain from answering or helping.  I ask students to solve the following problems…

3/4 + 5/8 =        Over four years, only nine students (4 were science majors) have been able to solve

1 2/3 – 5/6 =     Over four years, only five students (4 were science majors) have able to solve

Finally… You have been working for $6.24 per hour for 40 hours a week and, after taxes, your take home pay is $197.00.  You have just received a raise to $7.50.  What will your approximate take home pay be, provided that your tax rate remains consistent?  Over four years, three students (science students) have provided a correct answer of process.

The point being… just two years earlier, these questions appeared on the PRAXIS exam, which was necessary for entry into teacher education.  Because the information was no longer valued, nor was there a need to have it internalized, it was forgotten.

In the collaborative learning model, we see that the generation of synergies tends to give a social value to the information.  Instead of the process of learning being simply cognitively facts based, the social component provided and affective dimension.  As a result, information learned collaboratively tends to rise quickly to the stage of internalization.  One of the dangers of this process, once understood, is that it can be utilized to energize mob thinking.  The ethical considerations are profound

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