A Mastery Learning Option for Independent Schools

Introduction

It was such a small mosquito bite. Ansley, her parents, and even the physicians could not anticipate that the bite would lead to encephalitis for fifteen-year-old Ansley. The recovery was slow--over six months. Ansley had been a straight A student at a competitive private school for six years. Before her illness she and her parents had planned her path from high school, to a challenging liberal arts college, and then on to med school. How was the school to respond to her to help her catch up, complete her credits, and start her junior year on time?

Chris's mother was driving him home from a football game at his private school when a drunk driver plowed into the passenger's side of their car. Chris underwent three surgeries to repair his shattered right femur. President of the Student Council and the quarterback of his team, Chris had been an academically gifted, popular student for eleven years (twelve years counting Pre-K), and now he would miss six-eight weeks of school recovering from his injuries. He would miss additional classes for physical therapy following that. How could his school help him complete his junior year on time? How could the school award Carnegie Units with so many absences?

A Statement of the Problem

Most private schools across the South face similar situations like those above every year. Families have children who sustain injuries or contract serious illnesses. Students develop chronic diseases like Juvenile Diabetes, Crohn's Disease, asthma, and other disorders. Such students often overtax the school's tutorial system and pose problems for administrators who must wrestle with the difficulty of how to award Carnegie credits when the middle school or high school student has not met the attendance requirements even though the student may have earned a passing grade.

Other problems arise also, like serious illnesses of a parent or another family member, deaths in the family, or divorce of the parents may also adversely affect school attendance,

achievement and overall progress for students. For these and other reasons affecting a student's attendance and progress, independent schools can lose families who may be leaders in their school communities despite the school's best efforts to meet the students' needs.

Part of the problem facing many schools is the requirement that the student be present in the classroom for 120 hours to earn one Carnegie Credit. American public and private schools have had few formal options, e.g., summer school, grade recovery, and virtual learning, to respond effectively to these crises that occur in many children's lives. The Carnegie Unit, an academic accounting system has been around for over a hundred years. It brought "efficiency and standardization," as Tyack and Tobin remind us, to American colleges and high schools in the early 1900's (457). The Carnegie Unit also became part of what Tyack and Tobin call the "grammar of schooling," which influences time, subjects, and academic credit in collegiate and secondary education (457). Based as it is on seat time in the classroom and a passing grade, the Carnegie Unit, can also bring rigidity for students and teachers. Additionally, the Carnegie Unit redefined the "normal student" as "one who progressed at the regular pace demanded by the imperatives of the graded school" (Tyack and Tobin 459).

Given the research of the last century on human learning, adolescent development, and other topics related to the granting of academic credit, as well as the many circumstances that can complicate a teen's orderly progression through high school, is it not time to consider additional options for granting credit to students in certain situations?

The following review of the history of the Carnegie Unit and a reevaluation of Mastery Learning through individualized instruction--an approach which privileges mastery of the curriculum over time in the classroom--may suggest an innovative option to the problem encountered by many private schools with awarding credit to students who have gotten behind because of illness, accidents, and other understandable reasons. This study is narrowly focused on the benefits of a supplemental mastery unit for secondary school students provided through individualized instruction.

The Development of the Carnegie Unit

In 1892 a group called the "Committee of Ten" led the collective effort of American educators to systemize the then chaotic variety and quality of American schooling. Appointed by the National Education Association, the ten educators were primarily college presidents,

professors, or heads of secondary schools. Our country was changing from a primarily agrarian society to a more urban one. The Committee of Ten wanted to be able to quantify schooling, establish a canon of essential subjects, and provide a means of measuring what was learned for an increasingly mobile population. English, Mathematics, Physics, Chemistry, Astronomy, History, Latin, Greek, the Modern Languages, Natural History, Civil Government, Political Economy, and Geography were the major disciplines of knowledge, in their new, almost cursory nod to the arts and music.

Each member of The Committee of Ten chaired a subcommittee on one of the essential subjects. The President of Harvard, Charles W. Eliot, chaired the effort, and appeared to have been an active participant. The Committee primarily represented the Eastern United States, except for the presidents of the University of Colorado, the University of Missouri, and Oberlin College. What eventually became known as the Carnegie Credit Commission was appointed to study the problem of the uneven shape of the American secondary school and curriculum and recommend a solution (Tyack and Tobin). The members came to recognize the need for a unit of credit, some way of quantifying instruction. The commission was funded by a generous grant from the Carnegie Endowment for Education, and in time the unit of credit they developed came to be known as the "Carnegie Unit." The commission struggled to find commonalities across the subject matters of instruction. They decided to base their unit on *time in class*. So many clock hours of instruction by a qualified teacher and a passing grade would earn a student one unit of credit in that subject.

While The Carnegie Foundation for the Advancement of Teaching did not directly develop the idea of the unit, it did contribute substantially to its acceptance. When The Carnegie Foundation was established in 1906, Andrew Carnegie gave $10,000,000 to fund retirement pensions for college professors (Shedd 7). The Foundation wanted precise definitions for such terms as *college*, *university*, and *professor,* among other terms (Shedd 7*).* The whole process of establishing standards for what constituted a college eventually led to the need to establish standards for high schools that fed into colleges. The "Carnegie Unit" for the colleges receiving Carnegie pensions for their professors was defined and accepted formally in 1909 (Shedd 7). By 1910 almost all high schools measured academic work by Carnegie Units (Shedd 8).

The Committee of Ten's curriculum thus became the great standard for systemizing the high school education of Americans. As the country grew, American schools were

increasingly organized around the goals of this Committee of Ten, and high school administrators soon reported their students' grades in terms of Carnegie Units. The system was established by 1910 and has changed little since that time. With this system, however, it was assumed that some students would pass, and others would fail. Many Americans accepted it as a given that some students would drop out of high school. There were, however, educators with more progressive ideas who thought differently about learning and the awarding of academic credit. One of those ideas was Mastery Learning.

A Brief History of Mastery Learning

The concept of learning for mastery has been around in human societies for millennia. From classical civilization to the present, organizations requiring their members to have a high level of skill in one or more areas, usually "applied skills," have gravitated to the idea of learning to a standard of mastery for all their senior members, and to a more modest (but demanding) level of mastery for "journeyman" or "initiate."

In the modern era, several names stand out among many thinkers who came to mastery learning with their own ideas following their own path. Maria Montessori, for example, was not only the first female physician developer in Italy, she was also the originator of a brilliantly effective system for educating the very young. The system, which she originated in the tenements of Rome and in other Italian cities, now flourishes worldwide, especially in early education. Children are led to master fundamental concepts through the pervasive Montessori culture and materials as instructed by caring adults.

A second pioneer in Mastery Learning is the American psychologist and educator, Jerome Bruner. A strikingly original thinker, Bruner is a brilliant synthesizer of the work of many others in his own and other fields. Bruner's groundbreaking work *The Process of Education* (1960) suggested memorably that "any subject can be taught to any student at any age in some form that was honest, given the appropriate materials and approach" (qtd. in Bruner's *Culture of Education* 1996: xii.)

Bruner's *The Process of Education* and his other texts in learning and cognition became seminal works for American educational reformers dissatisfied with schools as they were. All over America and elsewhere in the English-speaking world, new schools began springing up with innovative ideas about teaching and learning. In time many of these

schools became members of a national organization dedicated to school reform, the Coalition of Essential Schools, founded by the former Harvard Dean, Ted Sizer.

Another innovator in Mastery Learning was the originator of scouting, Arthur Baden-Powell. His idea was to develop in young men (and later, in young women) the qualities of character and self discipline, as well as highly effective knowledge of and skills in outdoor living, camping, nature study, hiking, bird study and wilderness survival, among others. The newcomer to scouting, called a "tenderfoot," was required to learn an increasingly progressive body of information and develop skills as he rose through the ranks, principally by earning "Merit Badges" in many areas of knowledge. A pupil read and studied with another, usually older, scout or assistant scoutmaster who had himself mastered the skills demanded by the badge. Promotion within the Scout Troup was tied to merit badges earned.

One of America's leading educational psychologists and statisticians, University of Chicago's Professor Benjamin Bloom, became interested in learning for mastery in the 1950s. The highly respected Chief of Evaluation at the University of Chicago, Bloom proceeded to question almost everything having to do with school learning. He was especially concerned that instruction should be shaped to fit the personality and abilities of each student. Bloom argued that "students differ in the rate at which they can learn-not in the level to which they can achieve or in their basic capacity to learn…as many as 90 percent of the students can learn these school subjects up to the same standard that only the top 10 percent of students have been learning under usual conditions" (1981; 18). Bloom observed that students' academic learning closely followed a "normal distribution or bell-shaped curve," however, in the traditional school setting (Zimmerman and DiBenedetto 208). Bloom asked that educators reconsider the assumptions, fundamental ideas, and benefits of Mastery Learning.

Eventually, with Bloom's *A Taxonomy of Educational Objectives* (1956)-- a masterful trilogy addressing the cognitive, affective, and psychomotor domains--educators now had a systematic set of tools for categorizing and shaping curricular and other objectives of schooling. An exceptionally orderly, rigorous and insightful researcher and writer, Bloom worked at the problem of organizing learning into hierarchical categories in which basic skills like getting the facts are seen as underlying higher skills like analysis and synthesis. Bloom studied the learning experiences of children in actual classrooms and was struck repeatedly by how many students were not learning. Bloom formed his revolutionary postulate that "special conditions have been discovered under which both the level of learning and the rate of

learning become much the same from student to student" (1981; 18). This observation, as one will note, closely paralleled that of his colleague Jerome Bruner.

While some educators looked to Mastery Learning as a way to create more effective schools, the attempt to implement Mastery Learning in the public school classrooms encountered difficulty. Trying to teach all students in large group settings to mastery at the same time ran squarely into problems with student time use, scheduling and teachers', parents', and administrators' fixed ideas about schooling. Teachers struggled with implementation of Bloom's ideas in groups because students did not learn at the same rates, and students did not all work effectively outside school. Nonetheless, Bloom persisted, predicting that with mastery learning "individual differences in students' achievement would diminish" and that 90% of those taught using the Mastery Learning approach could achieve at a level reached only by 10% of the students taught through traditional teaching practices (Zimmerman and DiBenedetto 208). His provocative collection of essays, *Mastery Learning*, which provided a new way of looking at American education, challenged educators to find ways to teach to mastery.

Bloom's Model for Mastery Teaching

The teacher follows a simple procedure in preparing to teach a course for mastery using Bloom's four components: defining mastery, planning for mastery, teaching for mastery, and grading for mastery (Schunk 200). The first step is to decide with the student and dean or headmaster exactly what the course will cover -- which concepts are to be learned and what skills are to be developed. Mastery is defined in step one. The teacher should then divide the course into small units, each with associated learning materials and assignments. This process is called planning for mastery. Next there needs to be an appraisal of what the students already know, so that they are working at the most effective level. Many mastery teachers find that having a textbook or CD as a required base for the learning unit gives students, parents, and teachers a helpful structure and assurance. We suggest these steps to prepare to teach a course to an individual high school student. Then the teacher begins to teach for mastery.

The fourth step—grading for mastery—involves the Bloomian assessment or evaluation model. Professor Bloom stipulated two kinds of evaluation, *Formative* and *Summative*. Formative evaluation seeks to establish what the student has learned, and what still must be

learned. Summative evaluation is the final assessment. It is usually an examination, but it could also be a research paper, project, art portfolio, etc. The summative evaluation depends on the course, the teacher, and the student. Bloom's process for mastery learning through individualized instruction might look like this:

- Determine the course to be taught individually for mastery
- Meet with the student and agree on expectations
- Break the course into smaller units of about a week's worth of work per unit. (Thus an 18-week semester might have 18 units.)
- Each smaller unit should provide reading, math, viewing or listening homework assignments, which can be done at school if need be. The assignments are divided into clumps for expected daily work.)
- List what is to be learned in each section and determine how the student will be tested or evaluated on the material.
- Direct the instruction by explaining, correcting work as it is done.
- Help the student connect ideas of the smaller units to each other and to what has already been learned.
- Provide formative evaluation or tests, requiring 90% (BFA's passing grade) to move on. Formative evaluation also involves work, in which the instructor looks for the qualities stated in the course objectives, such as clarity, grammatical correctness, form of expression, etc.

There may be at least four occasions for such formative evaluations:

1. A Pretest over course material (This can be an informal evaluation or a more formal computerized or paper/pencil test.);
2. A Formative Evaluation at the end of each unit, covering the material that has been learned;
3. A Mid-Term Exam to make sure the student knows and remembers what was to have been learned to that point; and
4. A Final Exam that covers the material of the course and provides evidence of the student's ability to analyze and apply the new knowledge.

Along with this formidable evidence that the student has, indeed, learned the material, a teacher can answer any skeptics with facts – high marks and a folder/portfolio of the student's work showing how much actually was accomplished--beyond just the tests, which are convincing enough. Bloom's four-step Mastery Learning process has been a highly effective method for teachers to follow. Students can demonstrate what they know, and teachers are not restricted in the materials or mode of instruction best suited for an individual student's learning style.

Mastery Learning After Bloom

Following Bloom, educational researchers and graduate students found Mastery Learning a favored research topic. They constructed and carried out mastery learning studies, primarily in public schools. Guskey and Gates published a follow-up review of Mastery Learning studies entitled "A Synthesis of Research on the Effects of Mastery Learning in Elementary and Secondary Classrooms" (1986).

After Bloom's pioneering work, his pupils explored two questions: "Will Mastery Learning work?" and "Will Mastery Learning work in public school settings?" The early studies focused on these questions with primarily elementary and secondary school students. Some studies, however, looked at college freshmen introductory courses. While these studies seem informally positive about Mastery Learning, their subjects are, as pointed out earlier, outside the very limited focus of this paper-- individually-paced Mastery Learning in independent schools.

Mastery Learning for Students in Independent Schools: The Ben Franklin Academy and Emory University Reading Center Experience

Ben Franklin Academy grew out of the former Emory University Reading Center and Catch-Up School. From 1960-1987, students from around the Southeast who had fallen behind in school--usually as a result of some academic difficulty, illness, or family disturbance-- would often be referred to the Emory University Reading Center and Catch-Up School. Our task would be to help them complete or supplement their coursework. We would work one-to-one with the student, and, upon mastery of the agreed-upon assignments, we would report the student's progress to the school.

When we became Ben Franklin Academy in 1987, we continued our catch-up and accelerated work with high school students. As an independent school separate from Emory, we were able to seek SACS accreditation for our school and apply what we had learned about mastery teaching to the University of Georgia Board of Regents' College Preparatory Curriculum.

Our first graduate, in 1987, attended and graduated from Georgia Tech. Subsequent BFA graduates are accepted by and attend colleges and universities across America and abroad (See list.). These acceptances answer the question, "Can my teen get into college with credits from a school that offers Mastery Learning?" SACS accreditation was granted to us in 1994, and we regard accreditation as essential for a school that offers individualized instruction and continuous progress.

From spring, 1987, to the present, BFA has graduated over 1200 students. We have received generous support from the Atlanta educational, financial and foundation communities, who understand that such an educational option can be highly useful to families in independent schools.

Conclusion

At one time or another, most headmasters of independent schools are faced with the dilemma of a valued student who falls far behind classmates because of serious illness, injuries, debilitating family problems, divorce, etc. The list is long. Our society poses many challenges to students and those who rear and educate them.

The Carnegie Unit, as we said earlier, requires a total amount of "seat time" for credit in a course. In the Carnegie system it is possible for a student to make an A on the final exam and still not get credit because she/he has not attended class enough or turned in the right amount of homework. In Georgia and elsewhere, the state mandates a certain number of credits (Carnegie Units) in order to graduate. Other expectations are set forth by individual colleges and the University of Georgia's Board of Regents, who stipulate course credits that a student must have for a college preparatory diploma in Georgia. Essentially, these are very similar to the subjects that were recommended by the Committee of Ten over a century ago. A student who lacks any of these credits is said to be "deficient" or "to have a deficiency." Such a student can make up the deficiency in summer school or some other way, but college preparatory independent schools are understandably reluctant to grant diplomas unless students meet their standards.

We propose that students who are deemed eligible by their headmaster for accepted reasons like serious illnesses and injuries, death in the family, etc. be allowed to earn credit for high school courses through individualized instruction using the Mastery Learning approach, which is based on work accomplishments and the demonstration of solid knowledge.

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SELECTED COLLEGE AND UNIVERSITY ACCEPTANCES

Adelphi University
Agnes Scott College
Alabama A & M University
Albion College
Albright College
American International College
American University
Andrew College
Antioch College
Appalachian State University
Arizona State University
Armstrong Atlantic University
Art Institute of Atlanta
Auburn University
Augusta State University
Babson College
Bard College
Barry University
Barton College
Belmont University
Beloit College
Bennington College
Berklee College of Music
Berry College
Bethun-Cookman College
Birmingham-Southern University
Boston College
Boston Conservatory
Boston University
Brandeis University
Brenau University
Brevard College
Brooks Institute of Photography
Brown University
Bucknell University
Butler University
Catawba College
Charleston Southern University
Chatham College
Claremont McKenna College
Clark Atlanta University
Clark University
Clayton College & State University
Clemson University
Coastal Carolina College
Colby College
Colby-Sawyer College
Colgate University
College of the Atlantic
College of Charleston
College of Santa Fe
Colorado College
Colorado State University
Concordia College
Converse College
Columbia College
Cornell University
Culinary Institute of America
Curry College
Davidson College
Dickinson College
Drexel University
Drew University
East Carolina University
East Tennessee State University
Eckerd College
Elon College
Embry-Riddle Aeronautical University
Emerson College
Emory and Henry College
Emory University
Emmanuel College
Erskine College
Eugene Lang College
Evergreen State College
Fairfield University
Ferrum College
Flagler College

Florida A&M University
Florida Atlantic University
Florida Institute of Technology
Florida International University
Florida Southern College
Florida State University
Fordham University
Franklin Pierce College
Friends World Program of
   Long Island University
Full Sail University
Furman University
George Mason University
George Washington University
Georgia College & State University
Georgia Gwinnett College
Georgia Institute of Technology
Georgia Southern University
Georgia Southwestern State University
Georgia State University
Gettysburg College
Gordon College
Goucher College
Grambling State University
Green Mountain College
Grinnell College
Guilford College
Hamilton College
Hampden-Sydney College
Hampshire College
Hampton University
Hendrix College
High Point University
Hiram College
Hofstra University
Hollins University
Howard University
Humboldt State University
Huntingdon College
Indiana University
Iowa State University
Jacksonville State University
Jacksonville University
Johnson & Wales University
Johnson C. Smith University
Juniata College
Kansas State University
Keene State University
Kennesaw State University
Kettering University
LaGrange College
Landmark College
Lehigh University
Le Cordon Bleu College of Culinary Arts
Lewis & Clark University
Limestone College
Lindenwood University
Louisiana State University
Loyola College in Maryland
Loyola University New Orleans
Lynchburg College
Lyndon State College
Lynn University
Manhattanville College
Mary Washington College
McDaniel College
Mercer University
Miami University
Miami University, Oxford
Middle Tennessee State University
Mills College
Millsaps College
Mississippi State University
Mitchell College
Montana State University
Mount Holyoke College
New College of Florida

New England College
New York University
North Carolina State University
North Georgia College & State University
North Georgia Technical Institute
Northeastern University
Northern Arizona University
Northwestern University
Oglethorpe University
Ohio State University
Oregon State University
Oxford College of Emory University
Pace University
Paine College
Pennsylvania State University
Pepperdine University
Philadelphia University
Piedmont College
Pierce College
Pitzer College
Plymouth State College
Point Park University
Pratt Institute
Presbyterian College
Prescott College
Purchase College
Quinnipiac University
Randolph-Macon College
Reed College
Regis University
Reinhardt College
Rhodes College
Ringling School of Art and Design
Roanoke College
Rochester Institute of Technology
Rollins College
Rutgers, The State University
   of New Jersey
Salem College
Samford University
San Diego State University
San Francisco Art Institute
Santa Clara University
Sarah Lawrence College
Savannah College of Art and Design
School of the Art Institute of Chicago
School of Visual Arts
Seattle University
Seton Hall University
Shorter College
Simmons College
Skidmore College
Southern Methodist University
Southern Polytechnic State University
Southern Union State Community College
St. Andrew's Presbyterian College
St. John's College, MD
St. John's College, NM
St. Louis University
Stetson University
Suffolk University
SUNY-Buffalo
SUNY-Geneseo
Sweet Briar College
Syracuse University
Temple University
Townson University
Transylvania University
Trent University
Trident University
Trinity College
Tulane University
Tuskegee University
United States Air Force Academy
University of Alabama-Birmingham
University of Aberdeen
University of Alabama-Tuscaloosa

University of Alaska-Anchorage
University of Alaska-Juneau
University of Arizona
University of California-Davis
University of California- Santa Barbara
University of California-Santa Cruz
University of Chicago
University of Colorado-Boulder
University of Colorado-Colorado Springs
University of Colorado-Denver
University of Connecticut
University of Dayton
University of Denver
University of Georgia
University of Hawaii-Hilo
University of Hawaii-Manoa
University of Kentucky
University of Miami
University of Michigan
University of Minnesota, Twin Cities
University of Mississippi
University of Missouri Columbia
University of Montana
University of N. Alabama
University of N. Carolina-Asheville
University of N. Carolina-Charlotte
University of N. Carolina – Greenboro
University of N. Carolina-Wilmington
University of N.Carolina-Chapel Hill
University of N. Carolina-School of the Arts
University of New Hampshire
University of Notre Dame
University of Oregon
University of Puget Sound
University of Redlands
University of Rochester
University of San Diego
University of San Francisco
University of Southern California
University of South Carolina
University of South Florida
University of Tampa
University of Tennessee-Chattanooga
University of Tennessee-Knoxville
University of Texas-Austin
University of the Pacific
University of the South, Sewanee
University of Vermont
University of West Georgia
University of Wisconsin-Madison
Ursinus College
Valdosta State University
Vanderbilt University
Villanova University
Virginia Commonwealth University
Virginia Polytechnic Institute & State
   University
Virginia Technical University
Wagner College
Wake Forest University
Warren Wilson College
Washington and Jefferson College
Washington University in St. Louis
Wesleyan College
West Virginia University
Western Carolina University
Western Kentucky University
Western New England College
Western Washington University
Wheaton College
Wheelock College
Whittier College
Willamette University
Winthrop University
Wofford College
Xavier University
Xavier University of Louisiana
Young Harris College