



**Special Issue**

THE  
LEARNING  
ASSISTANCE  
REVIEW

*Journal of the National College Learning Center Association*



# About *The Learning Assistance Review*

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*The Learning Assistance Review* is an official publication of the National College Learning Center Association (NCLCA). NCLCA serves faculty, staff, and graduate students in the field of learning assistance at two- and four-year colleges, vocational and technical schools, and universities. All material published by *The Learning Assistance Review* is copyrighted by NCLCA and can be used only upon expressed written permission.

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## **NCLCA's Definition of a Learning Center**

The National College Learning Center Association defines a learning center at institutions of higher education as interactive academic spaces which exist to reinforce and extend student learning in physical and/or virtual environments. A variety of comprehensive support services and programs are offered in these environments to enhance student academic success, retention, and completion rates by applying best practices, student learning theory, and addressing student-learning needs from multiple pedagogical perspectives. Staffed by professionals, paraprofessionals, faculty, and/or trained student educators, learning centers are designed to reinforce the holistic academic growth of students by fostering critical thinking, metacognitive development, and academic and personal success.

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## Letter from the Editor

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Thirty years ago, Garrison Keeler's *Lake Wobegon Days* graced bookshelves. *Teen Wolf* starring Michael J. Fox was showing at the local drive-in, replacing *Back to the Future* (also starring Fox), the highest grossing film of 1985. "St. Elmo's Fire (Man in Motion)" by John Parr battled "Money for Nothing" by the Dire Straits and "Power of Love" by Huey Lewis and the News to top the music charts in the United States (all of them lost to the theme from *Mad Max: Beyond Thunderdome*, "We Don't Need another Hero" by Tina Turner). Ronald Reagan was sworn in for a second term in office, while Mikhail Gorbachev became the General Secretary of the Soviet Communist Party. The wreck of the RMS *Titanic* was located by Dr. Robert Ballard and Jean-Louis Michel. Pete Rose became the all-time hit leader in Major League Baseball. *Super Mario Bros.* hits the Nintendo Entertainment System console. *The Dukes of Hazard* finished their final season run, stepping aside for a new sitcom called *Growing Pains*. The space shuttle *Atlantis* makes its maiden voyage. The first smoking ban in restaurants in the United States was passed, ironically, in Aspen, Colorado.

And the National College Learning Center Association is formed.

Okay, not exactly thirty years ago, but we at NCLCA are counting 2015 as our trigentennial (a mouthful of a term internet sources tell me is commonly accepted, but I've never heard it before looking it up for this letter). Our records show thirty conferences, and those conferences have become the official touchstone for our members. Once a year, we gather in the spirit of collaboration and collegiality to share our knowledge and experiences as learning center leaders. Along the way, *The Learning Assistance Review* was born. The issue you hold in your hands, volume 20, number 2, represents twenty years of research, data collection, and observation by some of the most talented writers to grace our pages.

This year's conference brings together past presidents in a way

I've not seen before as they offer the keynote speech. You'll hear how NCLCA was formed and how far we've come since the 1980's, the decade *National Geographic* dubs, "the decade that made us." Like the "computer age," longtime NCLCA members will tell you tales of experimentation and innovation as learning center leaders struggled to understand their place in academia and create programs from scratch. It's a fascinating time, so I decided to use this opportunity for you to read the articles from some of our leaders and influential members. Sadly, many of the original drafts weren't available, having been written before the rise of Microsoft Word. Hard copies no longer exist, and retyping some of them proved cumbersome if not downright impossible – trust me: I tried. The articles you'll find in these pages still date back some ten years, which could be considered a lifetime in our business. Names like Sandra McGuire, whose presentations on metacognition pack the room, Tacey Holliday, who with Lisa D'Adamo-Weinstein, created our popular Webinar and Workshop Series (WOWs), Jim Valkenberg and Jack Truschel, who led us through a period of strong growth, and David L. Reedy, who just keeps coming back to the board for more grace these pages.

Had I room (and the time to type them all), I would've included the articles, "Transgressing Boundaries: the Politics of Radical Teaching and Developmental Education" by Lisa D'Adamo-Weinstein (Volume 1, Number 1), "College Students with Attention Deficit Disorder: Implications for Learning Assistance Professionals" by Shevawn Eaton and Sharon Wyland (Volume 1, Number 2), "The Tutoring Experience: A Qualitative Study" by Johanna Dvorak (Volume 6, Number 2), "An Investigation of Tutor Motivation through Survey Research" by current president Jennifer Haley, and others by Jacqueline Roberts, Kim Folstein, and Martha Casazza to name a few (all of these articles are available for free on our website). Truly, NCLCA has been blessed with strong leaders, researchers, and teachers.

Who knows? Thirty years from now, your article may appear in our anniversary issue. Stick with us, and I'm sure it will!

Best,

Michael Frizell  
Editor



# Honoring Our Past: The Founding of NCLCA

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Johanna Dvorak, 2005

I have found myself in a unique position, having helped found the Midwest College Learning Center Association in 1985-86, and having served as its president twice, once in 1993-94 and again in 2003-04. I have also served as a conference chair three times in 1990, 1993, and 2003 and as recording secretary, professional development chair, and as the 1995 Summer Institute Chair. This article, then, is my reflection of our organization from its inception in 1985-86 until today.

Wisconsin is the founding state for the Midwest College Learning Center Association (MCLCA) largely because our leader, Carol Cashen, was the Director of Educational Program Support at the University of Wisconsin-Parkside. Carol, a strong advocate for learning assistance, had already been hosting conferences and bringing in top speakers to UW-Parkside such as Alexander Astin and Claire Ellen Weinstein. Professionals also shared their expertise in breakout sessions. Carol lamented that the Midwest did not have a professional organization such as WCRLA, the Western College Reading and Learning Association.

The stage was set in October 1985 when a group of Wisconsinites met in Madison to consider and to design plans to begin the Midwest College Learning Center Association (MCLCA). After that meeting, a small group of us were selected to draw up bylaws and plan the first meeting. Members included Chair Carol Cashen; Brad Hughes, University of Wisconsin-Madison; Michael Marinetti, UW-Green Bay; Richard Behm and Susan Casper, UW-Stevens Point; and me from the UW-Milwaukee.

This group met in the winter of 1986. I can remember sessions with us hashing out details around a conference table in Brad Hughes' office overlooking Lake Mendota. Led by Carol, the group

was very cohesive and organized with a strong sense of purpose. As a young professional, I had a wonderful feeling to be part of the creation of a very special organization.

We held our first organizational meeting in October 1986 at UW-Parkside to vote on the bylaws and officially begin MCLCA with Carol Cashen as our first president. UW-Parkside lent support as we launched our organization, and our second president, Sandra Burmeister (1987-88), was also from Parkside. She chaired our next MCLCA conference in October 1987 in Milwaukee at the Hyatt Regency Hotel with keynote speaker Arthur Whimby. This started a trend of outstanding keynote speakers; some of these have been Martha Maxwell, Frank Christ, John N. Gardner, Stephen Brookfield, Blythe Clinchy, Patricia Cross, Wilber McKeachie, Ernest Pascarella, Sheila Tobias, Vincent Tinto, Beverly Guy-Sheftall, Anthony Grasha, Martha Casazza and Sharon Silverman.

MCLCA focused on an 11-state region: Wisconsin, Illinois, Iowa, Minnesota, Indiana, Ohio, Michigan, North and South Dakota, Kansas, and Missouri. Because Chicago was our largest city, we chose to alternate conferences between Chicago and another city in the Midwest. The conference was hosted in Chicago or Evanston, and Milwaukee, Minneapolis, Indianapolis, the Quad Cities (Bettendorf), and Madison.

National Louis University (formerly National College of Education) provided strong support for MCLCA. Martha Casazza became our 3rd President followed by Carol Eckermann from National Louis. The college also provided financial support to begin our journal, *The Learning Assistance Review*. Past Presidents Martha Casazza, Karen Quinn, and Nancy Bomstein made a great contribution as editors for *The Learning Assistance Review*. Since 2003, the journal editors have been Jeanne Higbee and Irene Duranczyk, both from the University of Minnesota.

UW-Parkside has held several Summer Institutes for learning center professionals. A memorable one for me was the summer of 1988 when Frank Christ, Martha Maxwell, and Brad Hughes were mentors. A friendship began when I was able to provide Frank a bike to ride around the scenic campus. The Summer Institute continues to provide an opportunity for professionals to develop a mentoring rela-

tionship with key leaders in our field. MCLCA Past President Nancy Bomstein (Alverno), Jan Norton (UW-Oshkosh), and Brad Hughes (UW-Madison) all were involved with NCLCA from its beginnings, were among the mentors at the Summer Institute this past June at UW-Parkside. Past Presidents Charlotte Short (UW-Parkside) and Jackie Robertson Harris (Ball State University) have co-chaired the past three Summer Institutes in 2001, 2003 and 2005.

Professionals from many other two-year and four-year institutions in the region have taken an active part in MCLCA. We have developed white papers and resource directories, presented at conferences, participated on committees, collaborated with other organizations, conducted research, and written for publications. When our participants in Summer Institutes and conferences started coming from other states, the membership decided to become a national organization with a focus on learning center management. President Shevawn Eaton, Vice-President Jacqueline Robertson Harris and their executive board were instrumental in this process in 1998-1999.

Past Presidents have continued to be very active in NCLCA, providing advice, heading projects, continuing on committees, mentoring, presenting and sharing at our Past Presidents' panel at our yearly conference. We have named scholarships and awards in honor of members whom we have lost to terminal illness: Past Presidents Brenda Pfahler, Karen Quinn, and Summer Institute mentor Julia Visor.

As I think back on the growth of our organization with pride, my hope for the next twenty years is that we continue to grow and share our enthusiasm about the field of learning assistance with newer professionals in this field. NCLCA has been known as a friendly, caring, and hardworking group. My wish is that they will follow our strong tradition.

### **Addendum by Jennifer Haley, 2015**

NCLCA has continued to grow, both in membership and in outreach through certifications, affiliates, professional development opportunities, and a tradition of distinguished Conference keynote speakers and Institute mentors.

The Learning Center Leadership Certification (LCLC) was

created to provide individual learning assistance certification on four levels; this is a nationally-recognized credential and set of standards that has been invaluable to the professionals in our field. The Learning Centers of Excellence program (LCE) was recently established to promote professional standards of excellence for learning centers. The Webinar and Workshop Series (WOWs) is an ongoing series of internet programming that offers an interactive professional development experience. All of these efforts were thanks in large part to the efforts of Lisa D'Adamo-Weinstein, Elaine Richardson, Rae Maslana, and Laura Sanders.

NCLCA is also helping to create and organize affiliates—networks of college learning support professionals. Thus far, Florida (FCLCA), Louisiana (LCLCA), and a regional consortium of South Carolina, North Carolina, and Georgia, which comprise the Southeastern chapter (SECLCA), have formed affiliates, complete with executive boards and conferences.

Our organization has continued a tradition of distinguished keynote speakers at our annual conferences, including Laura Perna, Carmy Carranza, Donna Ford, Frank Christ, Sandra McGuire, Hunter Boylan, George Kuh, and this year we are delighted to have NCLCA Past Presidents Johanna Dvorak, Martha Casazza, and Jackie Harris, and well as award-winning author Ken Bain, to name just a few!

*TLAR (The Learning Assistance Review)* continues to publish scholarly articles and reviews that address issues of interest to a broad range of academic professionals in the field of learning assistance, including articles about program design and evaluation, classroom-based research, the application of theory and research to practice, innovative teaching strategies, student assessment, and other topics that bridge gaps within our diverse profession. Christine Reichert served as Editor from 2006-2012, and Michael Frizell has been at the helm from 2013 to the present time.

Our organization began as a regional effort to draw together professionals from various parts of the Midwest to share ideas and build solid foundations for learning assistance practice and theory. From these beginnings, we have blossomed into a national organization that supports learning center professionals as they develop and

maintain learning centers, programs, and services to enhance student learning. For thirty years we have been focused on the needs of those who administer postsecondary learning assistance centers, and we can't wait to see where the next thirty years will take us!

Happy 30th anniversary, NCLCA!



# National Survey – What is a Learning Center in the 21st Century?

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Jack Truschel  
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## Abstract

This article examines survey results from 142 colleges and universities to identify various “Learning Center” functions in higher education. Surveys completed through telephone interviews and in person at two national conferences indicate that core student success services in higher education include tutoring, workshops, disability services, and programs for at risk students. Results from a subsequent review of participating institution websites identified learning centers’ mission statements and services. A final internet search found frequency of learning center names. These findings indicate Learning Centers have evolved into an essential multifaceted student centered division of higher education, but it is growing though an identity crisis.

Determining what the Learning Center can be in the 21<sup>st</sup> Century is a difficult task because of the multiplicity of definitions and “functions” connected to the term “Learning Center.” The various definitions of what a Learning Center is, what it is designed to accomplish, and what services it provides to the student gives some insight into the complex nature of the learning assistance discipline. Several definitions are dated while others are more comprehensive in design and scope. For example, one of the earliest yet most comprehensive definitions of a Learning Center is by F. Christ (1971), who stated that,

“A Learning Assistance Center is any place where learners, learner data, and learning facilitators are interwoven into a sequential, cybernetic, individualized, people oriented system to service all students (learners) and faculty (learning facilitators) of any institution for whom learning by its students is important” (p. 39).

Several years later, G. Enright (1975) defined the Learning Assistance Center as

...a place concerned with [the] learning environment within and without; functioning primarily to enable students to learn more in less time with greater ease and confidence; offering tutorial help, study aids in the content areas, and referrals to other helping agencies; serving as a testing ground for innovative machines, materials, and programs; and acting as campus ombudsman (p. 81).

In an attempt to provide a more specific definition, one author discussed four areas which comprise a learning center. According to G. Peterson (1975),

“A learning center is an amalgamation of four services: library, audiovisual service, nontraditional learning activities (including tutoring), and instructional development service (that is, the center assists faculty members in developing new teaching strategies, materials, and courses)” (p. 9).

A noted historian in learning assistance, M. Maxwell (1994), indicated that a Learning Assistance Center provides a variety of academic support to serve students, faculty, and staff in the most efficient manner. She also indicated that the director must coordinate programs and work closely with academic departments and other campus services.

A recent transformation in the model of learning centers moves toward the concept of a “learning commons,” defined by S. Keating and R. Gabb (2005) as follows:

The learning commons represents a greater functional integration of learning support than the information commons. In addition to contributions from library and IT services, the learning commons brings together other student services such as student learning support and in



some cases academic staff support. The library becomes one of three or more educational partners in supporting students. (p. 3)

Initially, the integration of these services may have caused concern that each service would become diluted due to the volume of work necessary to support the large number of students requesting help. The opposite was, in fact, true for many colleges; students found the cutting edge technology and skills available through library staff supportive in avenues that varied from those traditionally found in a learning center. As both academic services and student affairs professionals come to better recognize the skills available at the library, the learning commons, which often is complete with information technology as well, can become a place to serve students of today who have already come to expect quick response to questions through the internet. It appears that an approach such as collaborations found in a learning commons may be a win-win for both, student and institution, by addressing student needs and centralizing staff and equipment. The variety of learning centers identified by this background review has set the stage for this study to see what a learning center in the 21<sup>st</sup> Century may resemble.

## Method

### Participants

Based on a convenience sample, 142 colleges and universities participated in this national survey, which included community colleges ( $N=83$ ) and colleges and universities ( $N=59$ ). Eleven surveys were completed by telephone; the remainder were submitted at two national conferences (the National College Learning Center Association, held in Atlanta, GA and the College Reading and Learning Association, held in Portland, OR) during 2007.

### Procedures

This research was conducted via a three-pronged approach. The investigator developed a survey instrument based on the questions which were posed from previous conferences during formal presentations and informal conversations. Using the survey, researchers telephoned institutions selected from the Higher Education General Information Survey (HEGIS). Of the institutions contacted

via telephone, many directors chose not to participate, citing the lack of time. Several indicated that they would return the call, which some did. Most of the surveys ( $N=131$ ) were completed at the National College Learning Center Association Conference and the College of Reading and Learning Association Conference. This may limit the interpretation of the findings due to the narrow focus provided by those attending the conferences; however, it was used as a sample of convenience. The second prong used the completed surveys as a reference list of institutions. This list was provided to a graduate assistant who was given directions on how to access the websites of participants in order to review online postings of mission and vision statements. The final prong was to compile all of the information and to conduct an internet search. This search, using the Google search engine, was conducted in order to determine the frequency of terms (names of centers) used.

### **Results**

The following are descriptions of learning center services provided by the institutions participating in the survey. Table 1 highlights some of the total responses on what type of services learning centers provide.

These services are included in some centers yet not all. Discussion is included along with the results for the wide array of services that center directors identified in their survey responses. While several of the services were identified by just one or two of the respondents, they are an important aspect of this survey, therefore, are included in this forum to maintain the integrity of the survey format and to provide complete information.

### **Survey Responses**

The results from other survey questions are included following those for the services provided.

#### ***Responses per service.***

Tutoring and Academic Coaching (88% of respondents): Both are programs designed to support the student in learning specific material. According to Anoka-Ramsey Community College (2007),

Tutoring is an age-old practice and is defined as a person giving individual or in some cases small group instruction. Content knowledge is also an essential

**Table 1**  
**Number of Learning Centers Providing Selected Services**

	Disability Services	Tutoring	Academic Advising	First Year Experience	Academic Improvement	Women's Center	Grant Funded Programs	At-Risk Student Services
Collee or University N=83	42	76	30	15	56	0	23	33
Community College N=59	17	49	21	10	36	3	12	26
Total N=142	59	125	51	25	92	3	24	59

ingredient for a tutor; however, to be truly effective, a tutor must combine content knowledge with empathy, honesty, and humor (¶1).

The purpose of tutoring is to help students help themselves, or to assist or guide them to the point at which they become an independent learner and thus no longer need a tutor. In several schools, tutors are required to complete training that focuses on 1) learning theory, 2) study strategies, 3) communication strategies, 4) learning preferences, 5) diversity, 6) change as a process, 7) customer service, and 8) content strategies.

Workshops (65% of respondents): Many colleges and universities have a unique set of skills workshops, some of which are not academic and are focused on life skills. Some of the improvement workshops include 1) managing or dealing with academic stress; 2) alternatives to medical school; 3) choosing a major; 4) dealing with procrastination; 5) being a first generation college student; 6) how to get into top MBA programs; 7) how to be successful in math/science classes; 8) reading speed; 9) internships and career preparation; 10) memorization techniques; 11) midterms and finals preparation; 12) managing money; 13) opportunities in studying abroad; 14) reading a text book; 15) test taking strategies; and, 16) living with other people. Select schools also have workshops such as grammar workshops and calculator workshops which are provided in collaboration with host academic departments. Several learning centers also provide tip sheets and online resources related to study and skill improvement.

At-risk student services (41.5% of respondents): Higher education institutions are either proactive, targeting the low income or first generation students, or retroactive, providing services to those students who receive less than a 2.0 GPA. An at-risk student can also be undeclared, academically disadvantaged, have a disability, or be in need of any developmental course. According to Ferguson (2000), the at-risk student is defined as someone who is underprepared or a person who lacks the skills necessary to meet the academic demands of higher education.

Disability services (41.5% of respondents): Specific services are provided to students with various physical or mental challenges. According to the Cornucopia of Disability Information (2007), in

the fall of 1986, over 12.5 million students were enrolled in the nation's postsecondary institutions. Over 1.3 million of these students (10.5%) reported having at least one disability. Schools participating in this survey indicate that academic accommodations can include making special arrangements with individual instructors to allow special seating arrangements, the use of tape recorders or other recording devices in class, and extended time for examinations. Tutors, readers, interpreters, and note takers may be available to students depending on the nature of their disability. Some students may be provided with an aide to assist them in accessing books in the library. Most of the services are designed to provide reasonable accommodations to support student learning.

Academic Advising (36% of respondents): Centers provide a program designed to assist students to navigate coursework, obtain necessary referrals to campus resources, register for the next term, or obtain guidance related to academic issues. According to Tuskegee University (2007),

Academic advising is a developmental process which assists students in the clarification of their life / career goals and in the development of educational plans for the realization of these goals. It is a decision-making process by which students realize their maximum educational potential through communication and information exchanges with an advisor; it is ongoing, multifaceted, and the responsibility of both student and advisor (§ 1).

Grant funded programs (24.6% of respondents): These respondents indicated support by internal or external grants and are designed to support student learning. Often, the general focus is primarily on students who are low income and first generation college students. Services include assistance in completing applications for financial aid and testing; academic counseling to understand each participant as a multidimensional individual with a unique combination of strengths and weaknesses; tutoring services provided for participants with academic assistance on an individual basis; and career guidance. Usually, a grant-funded program is an equal opportunity program, success program (primarily foundation based), or Federal

TRiO program, e.g. Student Support Program or a state program which supports a similar population.

Professional development services (21% of respondents): These centers are predominantly professionally based (e.g. faculty) with a few reporting some student based services. The professionally based programs include teaching and learning processes, teaching style, classroom management, and college / university rules. The student based services include preparation for high stakes tests offered through praxis classes and GRE improvement courses. Some also have PSAT / SAT improvement programs. First Year Experience (FYE) (18% of respondents): FYE is a program designed for the first year student who is making a transition from high school to college. According to many colleges which participated in this survey, an FYE is an academic program designed for entering college for the first time. FYE includes co-curricular elements, such as student gatherings, activities, study skills, life skills, and college success skills. The program provides an integrated and challenging experience which serves as a “starting point” to assist students to make choices leading to academic success.

College or University Access Programs (6% of respondents): According to Lynn College (2007) access programs are defined, “as [the] students’ ability to access and achieve success in higher education” (¶ 2). The foci of access programs are usually specifically designed for a particular under-represented population: low-income, first generation in family attending college, underrepresented minorities, students with disabilities, and students who are returning to college later in life. Some of the specific types of programs are designed to assist students to enroll early, e.g. a summer bridge program, or to identify specific types and places of support service, in addition to those provided in the learning center itself.

Academic Improvement Courses or Workshops: (65% of respondents): Programs are provided to support and ameliorate identified skill deficits. According to Hattie, Biggs, and Purdie (1996), some of the most prevalent student identified needs include time management, note-taking, goal setting, motivation, and basic study skills. Eberling (1998) also reports that the lack of preparation is a strong contributor to students failing to complete degree requirements.

**Women's Center:** (2.1 % of respondents): Centers provide services particularly focused on women's issues. Many colleges define a women's center as a place and a resource open to all members of the college community. It is a space available for programming and events, advising and outreach, information and referral, leadership development, advocacy, meeting space and hosting various resources (books and magazines). Some women's centers work to transform discriminatory institutional structures by educating the college community about gender-related issues and the intersections of gender with race, class, and culture. Some centers also provide course work and integrate their focus into separate disciplines such as the Psychology of Women or Women in Politics.

**Other Categories:** These include writing, math, tutor, language, computer, and testing labs. Two percent of learning centers report having language labs to support ESL students, as well as those taking foreign languages including Arabic, French, German, Japanese, and Spanish. Computer lab access is described as having computers available, which students may use on a firstcome first-served basis. Testing lab services are described as testing labs where instructors may send students for the purposes of re-testing, make-up testing, and special needs testing.

### ***Decision making results.***

**Professional Staff:** With a clear majority of responses (31%) indicating that professional staff members primarily are responsible for daily operations of running a Learning Center, anecdotal notes were used to ascertain additional information. Through many conversations with colleagues, one question asked was, "Who is in charge of or directs the activities of the learning center?" Many said that their particular learning center activities were being directed correctly; however, none seem confident that the national consensus would encourage them to change leadership toward administration, staff, or faculty. This area was also confusing to those who were completing the survey, in that 22% either provided several answers or left the questions unanswered. Subsequent questions from the survey yielded the following results.

**Tutoring Fees:** A portion of the survey addressed the fiscal viability of learning centers. Responding to a question concerning tutoring fees, most of the respondents (96.5%) do not charge for tu-

toring services, and, for those who do, the fees range from minimum wage to \$15.00 per hour.

**Learning Center Management Tracking:** Center directors indicated assessing the use and need for services by tracking students and the use of program elements. Most of the centers surveyed (66.9%) track services used by students. Of those programs that track students' use of services, the majority use either a home grown system such as scan in / out with ID cards, paper and pencil, or a log book; however, many reported the use a database or spreadsheet (13.6%), e.g. Access or Excel; others use a commercial software system such as Tutortrac (9%) or Accutrack (7%).

Tracking for retention / persistence of students has become a more recent addition to the job of many directors. Of those schools in this survey who responded, a majority (50.7%) indicated that they now track student retention. A method to track students is through a mechanism noted above or through the data collected by the college / university institutional research department.

***Identified best practices.***

Most learning centers are proud of the services they provide to students and their focus on academic success. When asked what would be considered as “best practices” in providing services in the learning center, there was a wide array of responses.

**Service in Response to Student Need:** An overarching theme was to assist students in their academic development. Directors are proud of their flexibility and their fluid response to student needs and providing services such as expanding hours of operation based on the time of the year and the requests of the student. Several programs tout their certification (CRLA Tutor Training Program was the only certification noted) indicating they have met a national standard. Others report that centrality and a “one stop shop” is important. They report that they are located around the high traffic patterns of the student body and that they do not require the student to go to many locations for the services that are required. Several note a strong collaborative model that includes faculty liaisons, supplemental instruction, and specialized training programs. Drop-in labs and extending learning center hours, as well as drop-in tutoring to assist students with content areas, are described by many learning center programs. Additionally, many programs report that they provide



instruction on study skills, and, in particular, time management issues. These study skill programs are strongly recommended to students.

**Assessments:** Assessments that include an early alert initiative to identify at-risk students and their specific needs, coupled with early Interventions for at-risk students, are reported by several schools. These assessments focus on early identification and early treatment of the particular needs of each student through the use of skill based or deficit based instruments. Instruments such as the Learning and Study Strategies Inventory (1987) by Weinstein, Palmer, and Shulte are used by institutions as a means of helping the student to identify strengths and weaknesses. As the student proceeds through answering the short statements with a 5-point Likert scale ranging from “Not at all typical of me” to “Very much typical of me,” individual behaviors and perceptions on ten different scales are established. The scales include anxiety, attitude, concentration, information processing, motivation, self-testing, selecting main idea, use of support techniques, time management, and test preparation and strategies. When the student has completed the assessment, the learning center professionals are able to support the strengths and enhance the skills which were weak as identified by the student. In this manner, students can overcome areas they identify as weak and become more strategic learners.

**Tutoring:** Tutoring is another area which many schools indicate is an effective practice. For example, several schools note that open tutoring hours, individual attention, opportunities for one-on-one tutoring, peer tutoring, learning commons, and walk-in tutoring are all important services. Several programs note that trained tutors available 60 hours a week, tutors for as many majors as possible, and providing supplemental instruction are important for their students and have resulted in higher graduation rates. An issue that was noted often includes the de-stigmatization of students who seek assistance at the learning center or tutoring center.

**Additional Components:** Those that were identified include 1) excellent customer service; 2) flexibility of subjects supported; 3) friendliness and professionalism of the staff; 4) individual attention; 5) diagnosis related to learning issues and learning; 6) promotion of student independence; 7) providing a supportive atmosphere

for students; 8) meeting the needs of the nontraditional student by providing an evening family tutoring program; 9) strong counseling program; 10) supplemental instruction; 11) tailoring programs and services to the needs of the student quickly; 12) comprehensive testing services for all students; 13) time management workshops; 14) assisting students in a manner which supports Vygotsky's Scaffolding; 15) providing web-based resource and comprehensive computer labs; 16) assisting students with comprehensive information which is located on WebCT; and, 17) providing a welcoming environment.

### **Reviewing Mission and Vision Statements**

When reviewing the learning center mission statements posted on websites ( $N=107$ ), it became clear that most are committed to supporting and strengthening the academic experience of students. Several statements included terms to describe students' self reliance, enhancing their selfregulation, and assisting students in developing academic and educational goals. There was also a focus on empowering students to reach their full academic potential and to provide a supportive learning environment. Learning centers also promoted retention through mission statement phrases such as "to provide individualized instruction to promote retention" or "to assist students in meeting demands of college level work."

Along with the mission statements, which are predominantly student focused, some learning centers posted values in global terms. For example, one learning center website had values which include "A strong commitment to diversity and respect for all races, nationality, gender, social-economic status, sexual orientation, education, physical ability, age, faith, geographic origin, language, family background, culture, individuality, or veteran status." Others have used language to include "Customer Service," "Standards," and "Team Work," which are similar statements made by corporations and not necessarily institutions of higher learning. Another learning center's mission statement included "Providing an intellectually stimulating environment for students and faculty conducive to study and learning." This particular learning center is in the library, and as a result its focus encompasses learning for the entire campus and not just the student body.

Another component of what a learning center tries to accomplish is outlined in terms of outcome based performance. This

learning center director includes that its student body will achieve one or more of the following outcomes: 1) become more independent learners; 2) increase self-confidence; 3) decrease stress level; 4) improve grades; 5) become more aware of how they learn best; 6) increase knowledge of the subject; 7) complete homework assignments; 8) achieve potential; 9) better define and solve problems; 10) become more comfortable in using technology; 11) work more often with others; and 12) prepare for their goal, e.g. transfer to another college/university, obtain employment, etc. The director may be creating a concern with this outcome based list by overlooking the responsibility of assessing and providing evidence of accomplishing any of these goals. For example, with the goal to *achieve potential*, is there a corresponding assessment to determine *achievement potential*? In addition, most of the other outcomes would require an assessment prior to the student attending the learning center in order to determine if improvement did indeed occur.

What seems to be a more contemporary mission of a learning center is to provide access to online resources and data bases. Learning centers now often include one or more computer labs which are usually outfitted with a variety of software programs and Internet and e-mail access. Several learning centers also maintain a library of reference and course materials plus study resources for graduate and licensure examinations.

### **Internet Name Search**

Learning centers can be a powerful and integral part of a campus which encourages community and may enhance retention. It is a location where a student's major is not at issue because the focus is learning. The learning center is a space on the campus that provides access to the connective tissue—or a hub—where students can go to learn how to write, read, study, learn or do mathematic calculations, or learn a specific content area. However, uniformity in what a learning center is or what services it provides is not evident in the survey outcome. This is further complicated by the various names a Learning Center is called. The Learning Support Centers in Higher Education (LSCHE) website (December 2007) reported that there are over 140 different names given to learning centers from the United States, United Kingdom, Australia and Canada.

Based on a list of names compiled from the survey respondents, an internet search (using Google search engine) was conducted as a snapshot of the same time the surveys were gathered to search the “hits” on the labels used to identify their facilities. By far, the most popular label identified was Learning Center, with 82.9%. The next most frequently name is Writing Center at 7.12%. The least popular terms for the center were Academic Skills Coaching with .0002% and Academic Enrichment and Learning with .0003%. All of the titles and number of hits when conducting an Internet search can be found in Table 2.

*Table 2*  
*Learning Center Name Frequency of Participating Survey Respondents*

Number of Hits	Percentage of Total Hits	Title
44,800,000	82.9003%	Learning Center
3,850,000	7.1242%	Writing Center
1,190,000	2.2020%	Learning Resource Center
1,000,000	1.8505%	Educational Center
847,000	1.5673%	Success Center
548,000	1.0140%	Center for Teaching and Learning
438,000	0.8105%	Academic Support Center
402,000	0.7439%	Tutoring Center
344,000	0.6366%	Student Success Center
308,000	0.5699%	Teaching and Learning Center
200,000	0.3701%	Learning Assistance Center
88,100	0.1630%	Academic Support Center
25,000	0.0463%	Study Skills Center
410	0.0008%	Learning Achievement Center
170	0.0003%	Academic Enrichment and Learning
120	0.0002%	Academic Skills Coaching

Note: Search was conducted November 2, 2007 using Google search engine as a snapshot in time to correlate when the surveys were gathered. The “hits” are for each quoted term and not the number of organizations with the title in their name.

## Discussion

Conducting a national study on learning center functions and services is important to the field, as well as to the personnel who work in them. Clearly, there is a better sense of the organization of learning centers; however, it is also apparent that there must be a moderate amount of refinement related to terms, titles, structure, and so on. Additionally, areas of concern arose in the survey itself with open-ended questions that allowed for such wide ranging answers, evidenced in the naming of such a center. As the future of learning centers is pondered, professionals in the field are urged to identify additional best practices that are utilized on campuses of all types. By sharing this information at conferences and through additional research and publications, colleagues may embrace and utilize them to support student learning.

As the manager of the center looks to improve what is accomplished in support of student goal attainment, juggling demands is an ongoing feat. Identification of standards that support center and student needs, yet address the overarching goals of individual colleges and universities are individually driven. While recognizing that standards for learning assistance, such as those updated in 2008 by the Council for the Advancement of Standards in Higher Education (CAS), the manager will need to complete an assessment and then identify the goals to work toward. It is hoped that the information from this survey helped to identify both commonalities and exceptionalities which will be considered.

### Further Study

This research has resulted in some questions being answered, but omissions related to important questions did not become apparent until the data was analyzed. For example, many of the centers indicated having similar services yet these vary in their marketing. This may cause confusion to some due to the wide array of the institutions represented in the survey where a construct may be simple for some to create and sustain while for others this can be a major struggle. Most respondents indicate having peertutoring, an important construct for all centers, yet peer-tutoring can also be a struggle for the staff in a 2-year institution. This is because the peer will generally only work in the second year of college. After that year, the

student may graduate and move on; whereas in the 4-year institution, peer tutors may well work three or four years and sometimes even as a graduate student.

The survey shows that learning assistance is different in different institutions because of many factors specific to the type of school and its mission. A 2-year college may serve two masters, such as a terminal degree student and a transfer student, so learning assistance must serve both general and technical education. Likewise 4-year institutions serve those who enter: arriving directly from high school, transferring from a 2-year college, or entering graduate school. Each of these populations may need a variety of assistance, and it will be up to the learning assistance professional to ascertain what is necessary.

It is recommended that another national study should be conducted in order to determine information beyond structure and function. For example, what are the salaries of the director, professional staff, and faculty, as well as the tutors and supplemental instructors who work in learning centers? Related to tutoring, this survey did not assess the number of peer tutors, professional tutors, faculty tutors, or specialist (skill, writing, or math) tutors; this topic should be assessed in future research. A comprehensive set of data should be collected by all learning centers in order to support their needs and successes related to student persistence/retention. Learning center directors should be encouraged to review the best practices of other programs and integrate them into their programs.

### **Conclusion**

These results reinforce how learning centers have evolved into a multifaceted professional operation that addresses student success in higher education. Direct programs such as tutoring, workshops, programs for at risk students and services for students with disabilities are core aspects to learning centers in the 21<sup>st</sup> century. However, the results also indicate that learning centers are as varied as their names and provide a myriad of services that are individualized by the community college, college, or university setting. As a result, national organizations such as the Association for the Tutoring Profession (ATP), the College Reading and Learning Association (CRLA), and the National College Learning Center Association (NCLCA) are

urged to develop a working committee which can consolidate all of the similar terms and operationalize them for future study. Working with representatives to the Council for the Advancement of Standards in Higher Education (CAS), as well as the member organization of the Council for Learning Assistance and Developmental Education Associations (CLADEA), collaborative efforts to share the best practices in learning assistance will support the learning center of the 21<sup>st</sup> century. However, the work of these organizations crosses many categories ranging much further than the focus of this article.

There are issues which focus on tutor training for individuals as well as programs. The work of the ATP concerning individual tutors and that of the CRLA for tutor training programs generally may address tutor needs. Recently a certification was developed by the NCLCA for learning center personnel which may be embraced by all learning center professionals. This type of certification identifies reasonable standards for the professional to reach, or aspire to, and helps to create a higher quality of leadership for a learning center program. Through identification of best practices in student service delivery, center management, training, and other areas of concern, the work of learning assistance professionals is to be appreciated for what is accomplished on a daily basis. That is providing students with access to systems which support successful completion of their goals.

### References

- Anoka-Ramsey Community College (2007). What is tutoring? In Introduction to Tutoring tutor training, part of Student Services Department webpage. Retrieved November 2007 from [http://www.anokaramsey.edu/tutor\\_training/module1/intro\\_tutoring.cfm](http://www.anokaramsey.edu/tutor_training/module1/intro_tutoring.cfm)
- Christ, F. (1971). Systems for learning assistance: Learners, learning facilitators, and learning centers, in Frank L. Christ (ed.) *Interdisciplinary Aspects of Reading Instruction, IV*, Proceedings of the Fourth-Annual Conference of the Western College Reading Association. Los Angeles, 32-41.
- Cornucopia of Disability Information (2007). *Data on students with disabilities*. Retrieved December 2007 from <http://codi.buffalo>.

edu/archives/colleges/stats.htm

Council for the Advancement of Standards in Higher Education (2008). *Thirty years of professional standards*. Retrieved January 2009 from <http://www.cas.edu/CAS%20Resources/CAS%20Hand-out.doc>

Eberling, D. (1998). A comparison of the effectiveness of study strategies instruction with community college students. *Journal of Developmental Education*, 16, 12-18.

Enright, G. (1975). College learning skills: Frontierland origins of the learning assistance center in R. Sugimoto (Ed.) *College Learning Skills Today and Tomorrowland, Proceedings of the Eighth Annual Conference of the Western College Reading Association*, 81-92.

Ferguson, D. (2000). Re-examining at-risk. *Curriculum Administrator*, 36, 79-95.

Hattie, J., Biggs, J., & Purdie, N. (1996). Effects of learning skills interventions on student learning: A meta-analysis. *Review of Education Research*, 66, 99-121.

Keating, S. & Gabb, R. (2005) *Putting learning into the learning commons: A literature review*. Postcompulsory Education Centre Victoria University. Retrieved December 2007 from [http://tls.vu.edu.au/PEC/PEC\\_docs/Learning%20Commons%20report.pdf](http://tls.vu.edu.au/PEC/PEC_docs/Learning%20Commons%20report.pdf)

Learning Support Centers in Higher Education (2007). *Names from the United States, United Kingdom, Australia and Canada, given to learning centers*. Retrieved December 2007 from <http://www.pvc.maricopa.edu/~lsche/>.

Lynn College (2007). College Access defined. Retrieved December 2007 from <http://lynncollegeaccess.pbwiki.com/College%20Access%20Definition%20and%20Grant%20Description>



Maxwell, M. (1994). *When tutor meets student*. Ann Arbor: U of Michigan.

Peterson, G. (1975). *The learning center*. Hampton, CT: Shoestring Press.

Tuskegee University (2007). Academic Advising defined. Retrieved December 2007 from <http://www.tuskegee.edu/Global/story.asp?S=6925874>

Weinstein, C., Palmer, D., & Shulte, A., (1987). *Learning and Study Strategies Inventory (LASSI)*. Clearwater, FL: H&H Publishing Company, Inc.

### Referenced Association Websites

*Association for the Tutoring Profession*—[www.myatp.org](http://www.myatp.org)

*Council for the Advancement of Standards in Higher Education*—[www.cas.edu](http://www.cas.edu)

*Council of Learning Assistance and Developmental Education Associations*—[www.crla.net/cladea/index.htm](http://www.crla.net/cladea/index.htm)

*College Reading and Learning Association*—[www.crla.net](http://www.crla.net)

*National College Learning Center Association*—[www.nclca.org](http://www.nclca.org)



# Scaffolding and Tutoring Mathematics

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## Abstract

Tutoring is one of those skills which require the ability to communicate an in-depth understanding of the subject. This article is about scaffolding while tutoring, and the tutoring talents described can be applied across the curriculum. Lev Vygotsky's ideas about communication and education play a key role in the development of scaffolding strategies in tutorial or small group study sessions. These ideas can be used by a tutor/facilitator to help a student learn specific content at the most basic and immediate level of that student's academic need so it can be applied in a much broader context. The point of scaffolding strategy is to help tutors and facilitators engage students in the learning process.

**A**t conferences, one often hears that “conventional wisdom” informs us that tutors should not put a pen or a pencil on a student's work—should not do the work for the student in any way, shape, or form. This wisdom assumes the position that doing the work for a student is not conducive to the development of good learning strategies. In many ways, this is correct. Doing the work for a student will not enhance learning if the work that is done by the tutor is the only work being done. However, if the work completed by the tutor is part of a scaffolding strategy that will engage the student, bring a better understanding of the materials, and lead to the student's ability to independently do the work, then the assistance serves a good purpose, and conventional wisdom is, if not incorrect, then in need of some revision. The key strategy for any assistance a

tutor may offer is to keep the student engaged throughout the exercise while gently prodding for possible solutions through dialogue and by provoking problem-solving behaviors.

### **Background**

Scaffolding, a term coined by Jerome Bruner (1960) and described in detail below, is the technique that a tutor/facilitator might use to help a student to learn specific content. Scaffolding is a support strategy—a way to work closely with a student at the level s/he requires for the best possible learning outcome. Tutorial scaffolding acts just like the support structures one would see along the side of a building that construction workers use while completing various tasks. Once those tasks are completed, the scaffolding is removed. A tutor may use scaffolding to work with a student on difficult aspects of content materials and then remove that additional support once the student can independently complete the task.

Of course, since there may be the occasional student who attempts to “play” the system and have the tutor do all of his or her work, it is especially important for the tutor to make certain the student does the majority of the work as independently as possible. The decision about who is and who is not trying to play the system rests with the tutor, so it is important that the tutor try to determine what each student understands about the content, what the student can contribute to the process, and how much s/he can accomplish independently. From the tutor’s knowledge of the student’s current understanding and ability and willingness to actively engage in the learning process, the proper scaffolding can be applied.

The approach to tutoring may vary widely from student to student depending on the level of preparedness, learning style, personality, and any number of other factors. First meetings with students present an opportunity to find out about the students’ academic support needs by determining their current understanding of the content of the course. Students who need quite a bit of tutorial support are often weak (or entirely lacking) in prerequisite background material and may have problems keeping up with the course material. Other students may require much less from a tutor and will show this by being able to converse freely about major course topics. The amount of scaffolding used during sessions will be determined by what the tutor

decides about the student's abilities and current levels of understanding.

### **Vygotsky**

Scaffolding is an outgrowth of Vygotsky's ideas that is of particular interest and value to academic support personnel searching for positive ways to help students learn. While Vygotsky's research focused on the learning and language development of children, certain aspects of his thought can be illuminating and useful in a tutorial setting in order to help adult students learn, as well. Scaffolding is a support strategy that may be employed in collaboration between a tutor and a student at whatever age or grade level that student might be.

Lev Vygotsky, a Russian psychologist and educator, viewed learning as an event where communication is both individual and social. Vygotsky (1929) says that educational development uses "the primary function of speech...communication, [and] social contact" (p. 8-9). The self-centered language children use to learn and share information is social in nature and necessary for transmitting information that raises the individual's ability to actively participate in his or her social environment. It is this ability to move from the ego-centric speech where s/he "transfers social, collaborative forms of behavior to the sphere of inner-personal psychic functions" (p. 9) to a more social context that marks the educational development of the individual.

### **Language and Theory**

Communication has an impact on the ability of a student to learn. The terminology or words that are used in all social and educational interactions play an important role in what the individual will accept as real and valid. Language allows humans to construct reality and to describe and define their experience. Language becomes a purposeful series of signs, symbols, numbers, letters, words, art, music, or graphic designs that can transform the merely personal into a social context. With language, people share experiences and go beyond the confines of immediate experience to include reflection about things and events that cannot be seen or felt at a specific moment in time. Without language to define and describe our environment, reality is limited to personal and immediate local experience. Social and cultural consciousness would be limited as would emotional and

affective feelings such as empathy.

Vygotsky (1929) looks at a mnemotechnical method of memorizing, explained as, “the method of memorizing by means of signs” (p. 1). This technique is used, Vygotsky tells us, by children as they learn language and, later, other social and educational tasks. That is, the signs indicate what has to be learned, and the student discovers how to memorize the connection between the sign and what s/he is expected to learn. As the child matures and begins to understand the social uses of language, s/he “with the help of the indicative function of words ... begins to master his [her] attention, creating new structural centers in the perceived situation” (Vygotsky, 1978, p.35). This technique may be considered in terms of two facets: natural and cultural mnemonics. The distinction may be described as an applied pedagogical usage of Ivan Pavlov’s (Nobel 1904) ideas about association and conditioned reflex:

The relation between the two forms can be graphically expressed by means of a triangle: in case of natural memorization a direct associative or conditional reflexive connection is set up between two points, A and B. In case of mnemotechnical memorization, utilizing some sign, instead of one associative connection AB, the others are set up AX and BX, which bring us to the same result, but in a roundabout way. Each of these connections AX and BX is the same kind of conditional-reflexive process of connection as AB (Vygotsky, 1929, p. 5).

The “cultural” aspects of mnemonics in learning are inherent in teaching/learning situations in which the student participates at the direction of others; the “natural” aspects are those learning behaviors which are inherent with each individual. The social and individual are seen in a dynamic and symbiotic relationship during the learning process as the learner uses associations between and among signs to memorize information. The language of mathematics can be seen to fall under this rubric.

The agent that facilitates this memorization and learning may be, for our purposes, the teacher or the tutor. When scaffolding is used, the direct application of information to a given task will begin the associative process by using exactly those collaborative behaviors

that seem to have a positive impact on the child's ability to learn. Valkenburg & Dzubak (2009) point out that linking something new and/or difficult to something already known is intentional or purposeful learning. The collaborative model of scaffolding may offer a comfortable environment for establishing those links.

Often, students have difficulty learning the technical jargon for a class. It is very important that they learn such terminology, but it is just as important to remember that many do not arrive in class predisposed to learning that terminology. An association has to be intentionally made. During a tutoring session, whether using scaffolding or not, tutors should translate material into language that students can understand, followed by a restatement of the same material in more technical terms. This technique is relevant to Vygotsky's concept of mnemotechnical learning because understanding the proper terminology will follow the association and connection from the less complex to the more complex. That is one role of the tutor—helping the student move from one level of understanding to the next.

According to Vygotsky (1934a), a child goes through levels of learning or cultural development, starting with internalizing signs from the environment to the application of those signs in given situations. The process is one of change from naive psychology to cultural or mature understanding. In language development, children learn the meanings of words through the continued interaction with the people around them. They go from vague understanding to mastery. Progress from dependent to independent cognitive thought can be seen in this process of language development and in the way children solve problems.

Language, therefore, allows the shift between subjective and objective interaction and thought. It, language, allows one to create new contexts (formats) for a wide variety of things and ideas. This change of format is important because it implies a change in the cognitive perspective of the individual and is a subtle movement from inner to social or social to inner understanding. Vygotsky described this change in the shift from oral to written narratives:

Inner speech is condensed, abbreviated speech. Written speech [is] deployed to its fullest extent, more complete than oral speech. Inner speech is almost entirely pre-

dicative because the situation, the subject of thought, is always known to the thinker. Written speech, on the contrary, must explain the situation fully in order to be intelligible. The change from maximally compact inner speech to maximally detailed written speech requires what might be called deliberate semantics - deliberate structuring of the web of meaning (Vygotsky, 1934b, p. 2).

This shift in format, in perspective, then, precipitates a number of cognitive changes that allows for the development of what might be called higher order thinking skills including synthesis—the reorganization of concepts and abstract meanings into a newly organized and conceptualized purpose. That process of creating synthesis is part of the foundation that allows for the on-going transmission of social and cultural heritage. The essence of memory and learning and the development of a sense of participation in both individual and social circumstances are enhanced by the synthetic process of thought. That process allows individuals to engage, to participate, and to lead.

Vygotsky asserts that as humans develop, they construct understanding and perceptions of meaning and socio/cultural purpose from their experiences. According to Vygotsky, however, the individual is not ultimately responsible for what s/he learns but relies on his or her interaction with learned others. Without social interaction, then, humans would find it impossible to learn and use any of the socially acceptable strategies for living. The culture is a primary determinant of how and what the child will learn—learning is from the outside in:

The mnemotechnical memorizing can thus be divided without remainder into the same conditional reflexes as natural memorizing. The only new features are the substitution of two connections for one, the construction or combination of nervous connections, and the direction given to the process of connection by means of a sign. Thus new features consist not in the elements but in the structure of the cultural methods of mnemonics (Vygotsky, 1929, p. 5).



It is the responsibility of the culture and, therefore, the teacher, to find suitable ways to teach. The construction of cultural perspective should be guided by using techniques that will enhance the student's ability to learn. The onus of responsibility for developing a learner-friendly style of pedagogical communication rests, Vygotsky says, squarely with those who would transmit information.

Not all aspects of this particular argument ring true; socio/cultural norms can have a tremendous impact on the ability of a student to learn. The tutor or teacher should bear the responsibility of developing a clear style of presentation and communication. Yet, there should be some personal ownership of the learning process, some responsibility for learning that rests with the individual student. Solon, referred to as the law-giver of ancient Greece, proposed that one must know oneself. In Plato's *Apology*, Socrates offers the idea that "the unexamined life is not worth living" (West, 1979, p. 44). These views are important messages about the responsibilities that each individual has to him/herself and to his or her community.

Other thinkers believe that learning can proceed naturally and without much intervention from learned others—that an open environment where children can learn and grow as naturally is possible. A. S. Neill (1960), author of *Summerhill*, would argue that a student will learn what s/he wishes when it becomes important to her or him. Vygotsky (1929) would argue that anything that someone learns must be actively taught. Either way, it may be true that one can only offer strategies and tools for learning, but it is the student who will determine whether or when to use them.

Vygotsky's ideas about how children learn may be compared with the process of cognitive development advocated by Jean Piaget. According to Vygotsky, learning is a social event. Piaget focused on the individual learner as s/he advanced through the four stages of cognitive development. Learning is a natural aspect of what it means to be human, *but* there are social aspects of cognitive development as the student moves from egocentricity to cognitive independence: "The student becomes independent upon the successful completion of various learning tasks" (Valkenburg & Dzubak, p.20). One important aspect of Piaget's theories, however, is that a learner "reaches a plateau where s/he processes . . . new information and begins to de-

velop a new understanding of the world because of it” (Valkenburg & Dzubak, p.21). This concept of learning plateaus lends credence to Neill’s idea that a child will learn when s/he is ready. The concept of learning plateaus also supports the idea of scaffolding for adults because as the student learns new information, s/he still has to incorporate that information into a world view or understanding of how ideas may be linked and synthesized.

Piaget’s important work may be the middle ground between Vygotsky and Neill. Children and students do seem to move through stages of cognitive development and to process information at various plateaus of their individual learning that integrates (synthesizes) new material with information they already knew. But Neill’s point, that the individual should be responsible for his or her own learning when the time is right for him or her, is also relevant and seems to imply that there should be a social or cultural value placed on learning for the sake of learning—not just to get a job or to get along, but to learn because knowledge has value, that learning is the culmination of knowing oneself and examining what is important and meaningful in one’s life. At the same time, Vygotsky’s concept of the shared responsibility for learning has merit in that teachers, tutors, and facilitators should be responsible for teaching in a manner that will actively engage the student in the learning process. It seems to be a two way street. Seen as rigid absolutes, Vygotsky’s ideas seem stultifying and limited, the cultural imperatives too narrow, but the synthesis that includes the flexibility of the ideas of Piaget and Neill seems to offer a more positive set of options.

### **The zone and scaffolding**

According to Vygotsky, every student has the ability to be a learner and a leader in learning situations. He identified two areas of student learning: the Zone of Actual Development (ZAD) and the Zone of Proximal Development (ZPD). The ZAD is defined as the work a student is capable of doing independently—what materials and content the student can manipulate and use without assistance. The ZPD is defined as “the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance, or in collaboration with more capable peers”

(Morris, 2008, p. 1). In other words, it is that area where the student needs assistance in order to understand and apply content materials.

Vygotsky's idea is that the potential for cognitive development can be attained when children engage in social learning behavior. Transition through the ZPD depends upon full social interaction. The range of skill that can be developed with adult guidance or peer collaboration exceeds what can be attained alone. In this case, the individual and the social aspects of learning may be achieved when scaffolding is appropriately applied.

Jeffery Wilhelm and his associates, Tanya Baker & Julie Dube (2002), offer an overview of techniques that may be used to effectively apply scaffolding techniques while tutoring or teaching. The process can be described "I do; you watch > I do; you help > You do; I help > You do; I watch."

In other words, the tutor solves a problem while explaining each of the steps in the process. Next, the tutor solves a problem while asking the student to explain certain parts that s/he has come to understand; the tutor supplies correct information when the student has difficulty. The third step has the student solving and explaining the process for solving the problem while the tutor offers suggestions if and when the student needs assistance. The finale is reached when the student can independently solve the problem while the tutor sits by and silently watches. The scaffolding is removed as soon as the student is able to proceed independently. The student goes from learner to possible leader. These same scaffolding techniques can reap tremendous benefits in a small group setting.

### **Practical applications**

#### **Identifying need and demonstrating practice**

Some conventional wisdom about tutoring suggests that characterizing subject matter as hard is a negative approach to gaining student engagement in learning. However, anything that a person finds difficult is hard for him or her, by definition. Denying that is counterproductive. However, the difficulty of subject material does not preclude a successful outcome. As a student gains confidence and skill, it can sometimes be amusing to (intentionally) overstate the level of difficulty of the material. One can imagine a somewhat comical debate between the tutor who claims the material is extremely diffi-

cult and the student who argues that it is not so hard after all. One key seems to be the supportive dialogue with the student throughout the entire tutorial process.

One excellent teaching/learning strategy can be seen when one tutor asks another for help on a difficult problem. Here, the collaborative team effort will serve as a model that everyone sometimes needs help and that working with others is often productive. Usually, when tutors get together to solve a difficult problem, they will converse throughout the problem solving process. The exposure of students to this dialogue can be instructive and have a positive impact on their desire to learn because they can see the positive effects of collaboration and communication.

### **Assessing the student's work**

One cannot assume that a student approaches his or her studies using appropriate or beneficial learning strategies. Examining the student's work will allow the tutor to suggest those learning strategies that may help the student to learn better, thereby reducing some of the stress the student feels and thus allowing an easier path to learning.

It is helpful to observe the quality of work already done by the student when deciding which approach to use in helping the student. It will help the tutor to determine just where to apply the necessary scaffolding.

While discussing this process of assessing a student's abilities, David Witbrodt, a math and science tutor with over fifteen years experience, commented that he automatically attempts to assess the level of understanding of any new student he works with and attempts to "jump to the level of that [mathematical or scientific] formula that seems most appropriate" (personal communication, March 14, 2010). It is important to note, however, the revealing comment he made immediately thereafter. "I am often wrong in my first approximation, and have to jump backward or forward in response. Indeed, I sometimes find myself jumping backward and forward during a single tutoring session, as the student's skill level varies with varying material." The process is dynamic and changes according to what the student brings with him or her to the table. The tutor has to be astute and flexible enough to move along with the student.

Earlier, the Socratic Method, the technique of asking a string of directive questions during the dialogue with a student, was mentioned. The dialogue is a way to engage the student in the work and to assess the root of the student's immediate academic support needs. Scaffolding is a worthy technique that can complement or be complemented by Socratic dialogue, and together, they can have a positive impact on student success.

### **Conclusion**

A few years ago, the idea of scaffolding was much more difficult to talk about among members of the tutoring profession. Any discussion of putting one's pencil on the paper or of doing problems for students was strictly forbidden. It is still difficult to get faculty members to understand the concept and see the value of using sample problems. The tutor solves the problem in order to demonstrate the proper method to the student. This serves as the foundational learning platform for students. Scaffolding, when used during tutorial sessions and in small groups, is a powerful tool for helping students to actively engage in their work and in promoting self-sufficiency.

Vygotsky suggested that "What the child can do in cooperation today [,] he can do alone tomorrow" (as cited in Wilhelm, 2002, p. 6). He also suggested that "instruction is good only when it proceeds ahead of development. It then awakens and rouses to life those functions which are in a state of maturing, which lie in the zone of proximal development. It is in this way that instruction plays an extremely important role in development" (as cited in Wilhelm, 2002, p. 6). This instruction can be supported by using scaffolding as an approach to support student learning, because it reflects good classroom teaching/learning practice of instructors who show sample problems for new content. If instructors fail to show examples, or show inadequate examples, or show perfectly adequate examples that the student is simply unable to comprehend during the class period, then using the scaffolding technique can be of great benefit by providing appropriate examples of problem solving techniques.

Scaffolding, then, is essentially a technique a tutor/facilitator might use to enhance his or her ability to determine the level of independence of the student with regard to a specific set of materials and then to move the student toward the ability to work alone. Not every

student will go from failing to an A, but the object of our collective endeavors as tutors and facilitators is to help the student to see that s/he can succeed, and to offer a number of suggestions about how the student can solve the problem independently—to become, perhaps, better critical and creative thinkers.

As educators, we, too, need to be critical and creative in our approaches to earning and gaining the trust of the students who come to us. We have to question why and how we do the things we do. We have to reassess the methodologies and technologies we use to teach and understand why we use them. Conventional wisdom, tradition, the way tutoring and teaching has always been done, is not an excuse for ignoring beneficial methods for improving the chances for student learning and success.

### References

- Bruner, J. (1960). *The Process of Education*. Cambridge, MA: Harvard University Press.
- Morris, C. (2008). *Lev Semyonovich Vygotsky's zone of proximal development*. Retrieved March 12, 2010 from <http://www.igs.net/~cmorris/zpd.html>.
- Neill, A. S. (1960). *Summerhill*. Oxford: Hart Publishing.
- Nobel Prize in Physiology or Medicine 1904. Pavlov, Ivan. Biography. Retrieved August 20, 2010. [http://nobelprize.org/nobel\\_prizes/medicine/laureates/1904/pavlov-bio.html](http://nobelprize.org/nobel_prizes/medicine/laureates/1904/pavlov-bio.html)
- Valkenburg, J. & C. Dzubak. (2009). *The engaged mind: Cognitive skills and learning*. Charleston, SC: CreateSpace.
- Vygotsky, L. S. (1929). *The problem of the cultural development of the child*. Retrieved December 9, 2009 from [http://www.marxists.org/archive/vygotsky/works/1929/cultural\\_development.htm](http://www.marxists.org/archive/vygotsky/works/1929/cultural_development.htm)
- Vygotsky, L.S.. (1934a). Thought and Word. Chapter 7 of *Thought and language*. Retrieved December 9, 2009 from <http://web.archive>.

org/web/20020224051227/marxists.org/archive/vygotsky/works/words/vygotsky.htm.

Vygotsky, L.S. (1934b). Written, inner and oral speech. Excerpt of Chapter 6 of *Thought and language*. Retrieved March 12, 2010 from <http://www.marxists.org/archive/vygotsky/works/words/vygotsk1.htm>

Vygotsky, L.S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

West, T. (1979). *Plato's Apology of Socrates: An interpretation, with a new translation*. Ithica, Cornell University Press.

Wilhelm, J., T. Baker & J. Dube. (2002). *Scaffolding learning*. Retrieved March 12, 2010 from <http://www.myread.org/scaffolding.htm>.

Witbrodt, D. (2008). *Tutoring mathematics*. Retrieved from <http://myatp.org>. Association for the Tutoring Profession Online workshop presentation.





# Discovering Focus: Helping Students with ADD (Attention Deficit Disorder)

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## Abstract

Attention Deficit Disorder (ADD) is a neurological disorder which effects learning that has a confusing set of diagnostic symptoms and an even more confusing set of remedies ranging from medication to meditation to nothing at all. Current neurological research suggests, however, that there are strategies that the individual with ADD can use to focus and to learn. Recent findings about brain plasticity and how the brain processes information can offer students with ADD a variety of strategies that will help them to learn how to learn better. It is the goal of this narrative to demystify ADD and offer some possible solutions that do not cost anything but the time it takes to adapt to a more effective style of learning.

## The Nature of ADD

It may seem strange, but most of the students with ADD (for the purposes of this narrative, ADD and ADHD will be used interchangeably) who come to the tutorial center have not been told about the nature of their disability. Oh, they've been told the name of it, but the how and why of the specific disability is usually left blank—quite possibly because there is no one specific definition for ADD nor one specific set of symptoms.

Jacobs and Wendel (2011), in their online monograph, “Three Types of Adult ADD,” state: “Although scientists haven’t yet pinpointed the exact mechanism that causes ADHD, they have discounted many older theories and are conducting promising research that suggests the disorder is caused by an imbalance of neurotransmitters

in the brain” (p. 15). There are several neurotransmitters that seem to play a role here. Two of them that seem to play a key role, according to Jacobs and Wendel are epinephrine, and norepinephrine which help to transmit physical impulses. A third, dopamine, plays a key role in how attentive or passive one might be in a given situation. Another, serotonin, plays a role in affective behavior. An imbalance of the neurotransmitters can lead to an agitated state of consciousness or one where the individual is not motivated to engage.

Ritalin is one of the drugs used to regulate the level of neurotransmitters in the brain. In his review of an article published in the *Journal of Neuroscience*, Osterweil (2007) reported that research conducted on rats to ascertain the effect of Ritalin on the brain, suggested that “alterations [in the brain] included neurochemical and cellular changes—but not structural changes—in ADHD-related regions, including the medial prefrontal cortex, striatum, hippocampus, and hypothalamus” (p. 1–2). He also reported that the researchers thought the changes could be reversible after the animal was taken off the drug, but they indicated more research was necessary to determine if there were any long-term effects (p. 2).

In their comparison of treatments for ADHD between Ritalin and Neurofeedback techniques (EEG), Nazari, Querne, De Broca, and Berquin (2011) found that, on the average, Ritalin was more effective in helping the student to focus. However, the small size of the experimental sample suggests that the difference in the findings may not be significant and that a much larger sample is needed to obtain clear differentiation (p. 83). Furthermore, Nazari states that:

Overall, our findings might provide further support to the view that neurofeedback can be considered an effective treatment for children with ADHD, at least an appropriate adjunctive treatment for non-responders or incomplete responders to medication as well as for those their parents favor a non-pharmacological treatment. (p. 83)

Regardless of the cause of ADD, the system-wide dysfunction is essentially characterized by a variety of symptoms including forgetfulness, reluctance to take on tedious tasks, distraction and inattention, carelessness, and disorganization. One might see how these

symptoms are interrelated. If one is disorganized and has difficulty focusing on one topic, s/he may become more easily distracted and choose to stay away from those tasks that require attentiveness and strong organizational skills. Lack of focus and easy distraction may also be a reflection of some executive function disorder, as well. Information is stored in many different areas of the brain, and access to and integration of that information is controlled as an associative process that constructs a consistent, coherent picture. Executive function sorts it all out to construct a unified picture that, in general, the person with ADD seems to have difficulty constructing. Inattention, or lack of focus, means the materials the student wishes to study and remember are not effectively processed into long-term memory. Jacobs and Wendell (2011) said that “[s]ome scientists believe the root cause of ADHD lies with response inhibition, or the ability to control ... impulses, stay focused, and delay immediate gratification” (p. 11). But these inabilities have an impact on how the brain processes and stores information into long-term memory. It is important to note that working memory can usually deal with two or three items at a time and then essentially stops processing information. The brain of the student with ADD tries to do too much—taking on more input than is possible to process at one time—and this overloads short-term memory, causing it to shut down (Dzubak, 2008 p. 2–3).

Since there is no central location for storing specific bits of information (although there are specific locations for processing certain types of stimuli and information), it is important to understand the complexity of integrating pieces of information that can be scattered across various parts of the brain. Kandel (2006) offers data from a series of experimental research projects that have shown the diversity of integrating processes required to access even the smallest bit of information. Crick and Koch (2005) also addressed the complexity of memory and the integration of bits of information into a cohesive whole. They tell us that, “A key feature of almost all neuronal theories of consciousness is the need for continuous interactions among groups of widely dispersed pyramidal neurons that express themselves in the ongoing stream of conscious percepts, images and thoughts” (p. 1271). That the individual with ADD has difficulty integrating information can be seen in his or her frequent inability to

organize or actively engage in specific projects. That students cannot focus means they do not get enough information into or out of their memory to be able to integrate (synthesize) as necessary. Jacobs and Wendel (2011) said that students with ADD “don’t necessarily have a bad memory so much as a defect in one or more links of the highly complex chain that makes up memory” (p. 11).

When one adds the distractions inherent in modern computer technology and the demand that people multitask (an impossible chore for many) to the already befogged brain of the student with ADD, then one can begin to understand the difficulty that individual will have when learning. The lack of focus and attention poses a significant challenge. The experience might be likened to trying to put a jigsaw puzzle together without a picture as a reference to know which side of each piece was up. Whether the individual has a problem with acquiring and processing information into memory because of distractions—environmental or technological—or storing memory because of some executive function disorder, or accessing, transferring and synthesizing information to understand a problem in a new light, motivation and active engagement in the learning process is difficult for the student with ADD (Jacobs & Wendel). The students “fog out” and have difficulty linking information, so it will be harder to locate and process.

### **Rewiring the ADD Brain**

Memory is—and should be—more than storing isolated bits of information. Our brains constantly make connections between ideas. Each individual, however, can begin to train his or her brain to link information in a more meaningful way—can deepen the neural pathways between neurons and strengthen the neural communities that are formed. (Valkenburg, 2010) The work of Merzenich (2011), a pioneer in modern neuro-research, Kandel (2006), a key experimental neuroscientist, Doidge (2007), who described the positive experiences of people overcoming brain dysfunction, Zull (2002), an advocate for developing active teaching techniques that will stimulate neuronal growth, and Schwartz (2003), whose clinical work with patients with OCD is an important step towards using the concept of plasticity to help patients find mental stability, focuses on the brain’s ability to change every day. That is, the brain rewires itself as the individual

experiences, learns and relates various experiences and ideas together. This concept of brain plasticity is important to note when working with any student, but with students with ADD, in particular. Their work is summarized as follows.

### **The Theory**

Normal brain activity is an electro-chemical process whereby an electrical impulse causes a neurotransmitter to waft from the synapse of an axon across what is called the synaptic cleft to a receptor synapse on a dendrite. As the individual returns to the same idea or experience, the neurons form a pathway that is easier to use in order to access that bit of information. Using what has been called “Hebb’s Law” (Goldstein, 2012), neuroscientists have come to understand that “neurons that fire together, wire together”—neural communities (neural networks) are formed when a series of neurons all fire around a specific set of ideas or stimuli. They function as a unit, so actively, mindfully, purposefully linking and reinforcing ideas together establishes a broader and more cohesive series of neural communities. Although the brain does this naturally, albeit unconsciously, doing so consciously gives the individual more control over the knowledge and its subsequent access and use. Indeed, frequent and strong stimuli along a given neural pathway cause the neuron to “grow” new synaptic terminals to accommodate additional signal transmission among the neurons. A fascinating description of the process of synaptic growth can be found in Kandel’s *In Search of Memory* (Kandel, 2006, p. 247–60 & 261–278).

Brain plasticity, then, means that the topography of the brain changes with each new experience and that repeated access to certain types of information or the use of certain methods to acquire and store information has an impact on how the brain functions and the ease which information can be accessed and used.

Every thirty years or so, there seems to be renewed interest in Eastern philosophy. This investigation often brings with it a new synthesis of ideas that merges Eastern meditative ideas with Western science—C. G. Jung and G. I. Gurdjieff in the 1930’s, Alan Ginsberg, Jack Kerouac and the Beats in the 1950’s, Joseph Campbell and Alan Watts in the 1960’s and ‘70’s, and, now, Jeffery Schwartz in the early 2000’s, for instance. This merger can be understood by two examples.

Biofeedback techniques that are used in Lamaze training for expectant mothers were developed around the Hindu principle that mind and body are a constant feedback loop and control of both is possible through meditation and breathing techniques. The idea is that by focusing on something other than the pain experienced during labor, and using meditation and deep breathing in some cases and rapid breathing in others, the patient will transcend the pain of natural childbirth. The second example of the merger of East and West is the idea of Cognitive Feedback now being used to focus patients on particular occurrences within the brain. While Western technology appears to be the driving force behind this technique, cognitive feedback is based on the Buddhist concept of “mindfulness”—becoming aware of where and when you are—to focus on the now. It is this concept of cognitive feedback that most relates to students with ADD.

Cognitive feedback requires that the individual be in contact with the impact of his or her emotions, attitudes and motivations in terms of understanding environmental stimuli. Cognition depends upon the quality of the reception and the attention the individual uses to learn information and consciously make connections and associations between ideas. Cognitive feedback includes a metacognitive approach that answers questions about just what conscious and unconscious connections had to be made in order to reach a given idea or decision—to ascertain what associations were made to access and use information. Metacognition requires self-awareness and the ability to recognize and regulate the learning processes through which conscious and unconscious associations between new and known information are formed. Cognitive feedback asks that students be aware of their own responsibility for learning and reaching goals. The techniques students with ADD can use to develop learning skills are examples of cognitive feedback and metacognition at work.

### **The Model**

Since students with ADD have difficulty focusing and organizing materials, it is essential that part of the process of learning how to learn include techniques to recognize and reprioritize the time one spends studying. Sometimes students try to learn all the material at the same time rather than taking the assignment one step at a time.

As a result, they make the task of learning too complex because they do not prioritize the importance of one activity or one idea over another. Learning is a gradual process of constructing information into holistic schemas organized around various themes. If the student can learn how to reframe his or her perspective of learning and develop positive traits that actually work, s/he can learn how to succeed.

In their book, *The Mind and the Brain*, Schwartz and Begley (2002) offer four “Rs” as a solution for his patients with Obsessive Compulsive Disorder (OCD). To overcome their disability, patients are asked to: 1. Relabel or recognize that certain thoughts and behaviors are not productive, even if they do come to mind over and over; 2. Reattribute negative thoughts and behaviors to some type of malfunction in the brain that triggers an habitual response; 3. Refocus or identify and implement a directed alternative behavior (a “good habit”); and 4. Revalue or use “wise attention” to recognize the negative attributes of certain thoughts and behaviors as compared with the positive attributes of replacement behaviors. Dr. Schwartz has claimed great success from many of his patients with OCD.

Schwartz’s methodological approach to rewiring and restructuring the brain can be integrated with other academic support when working with students with ADD. The process also works for them, too. They find they can change their behavior and their outlook about who they are and how they can learn.

### **The Interview**

Many of the students with ADD who come for consultations with academic support personnel do not understand their disability. This frustrates students and makes their task of learning even more difficult. The first step, therefore, in the initial interview is to have the tutor ask the student to tell his or her story about the difficulties with learning—what “fogging out” (losing concentration) is like, and how s/he has tried to compensate for the disability. As both student and tutor come to terms with the limitations caused by the student’s disability, the process of mutual understanding and trust begins. If the student believes the tutor understands what it is like to struggle with learning because of ADD, then the foundation is laid for the next step. Remember, there is no set script—each person is different, and the tutor has to find a way to both engage the student and foster

mutual respect.

### **Relabel/reattribute**

Once the problems one specific student has and how it makes her or him feel is discussed, the process can begin. According to Bloom's *Taxonomy of Educational Objectives* (Bloom, 1956), there are at least three domains of learning: cognitive, affective and physical. The disability is the physical realm, and it is there that the rewiring of the brain will occur. But one also has to remember that the student has usually faced repeated failure and has quite a bit of baggage in the affective realm. It is important to remove that baggage before the student can finally succeed at the cognitive level.

Following Schwartz and Begley's lead, make sure that the student understands not only the nature of the disability but also what the brain is doing and why. Some basic brain physiology is required so the student understands how neurons communicate, how ADD interrupts the usual electrical-chemical process, and the impact that has on learning. When discussing neural pathways and neural communities, it becomes easier for the student to understand what is physically happening in his or her brain is causing the learning problem. The student can then relabel and reattribute the learning difficulty to the physical realm rather than a personal, affective, shortcoming. Knowing about the disability is somehow refreshing because the student can begin to use a systematic approach to finding the best way to learn.

### **The Process**

Once a student is comfortable with the idea that learning is not impossible, s/he is ready to discover ways to rewire her brain and find ways to focus and learn. The first step is to discover how long a student can focus before "fogging out." That is, finding a way to determine his or her attention span. This step entails having a stop watch or timer. When the student starts to study, the watch should be started. Once the student is aware that s/he is not focusing or is not aware of what s/he has just read, the watch should be stopped. After trying this a number of times to establish the norm for the student's attention span, the student can then more accurately set a time limit for effective periods of study.

Finding the length of the attention span is important because



when students with ADD find they don't remember what they have just read, they usually start all over from the beginning. But they have probably been able to retain some of the earlier information, so starting over from the beginning is counterproductive—and boring. They know the earlier information and reinforce it often, but the information later in the reading is minimally considered. The idea is to get them to start from where they left off so they can come in contact with all of the content.

In order to get the most out of the time the student with ADD spends studying, s/he should work within a time limit. That is, s/he can set a timer for two or three minutes less than the time s/he has established as her attention span. That will allow her to get up and refocus *before* losing contact with the assignment. For instance, if the attention span of a student is nine minutes, when s/he sits down to study, s/he should set her timer for seven or eight minutes. When the alarm goes off, s/he can stand up, take a brief walk, take a drink, whatever s/he is comfortable with in order to refocus on the assignment and then to start from where s/he left off. When s/he starts again, s/he should restart her timer. As time goes on, and the student is better able to refocus by using a procedure that will allow for better study and learning, s/he can begin to think about stretching the attention span. Stretching the attention span can be accomplished in small increments of time. From the original nine minutes, the student can make eleven minutes his or her short-term goal, then thirteen, then whatever limit s/he thinks can establish a new norm. The process is self-referential, metacognitive, and requires that the student be mindful about what s/he is experiencing and how much progress s/he is making. The rewards are internal and will be reflected in the quality of learning of the student.

### **Refocus and reformat**

Focus is a key factor for learning. Being able to center one's attention on a given task allows the smooth transition from short-term to long-term memory. Without focus, the memory of a given event or piece of information will last only as long as it stays in short-term memory—a matter of minutes. For the student with ADD, focus is extremely difficult to maintain for extended periods of time. It is, therefore, necessary to offer the student a range of possible tech-

niques and strategies s/he can use to establish focus at the beginning of a study session and to later refocus after a period of time.

For a student with ADD, non-focus occurs as a result of an overload of stimuli. Usually, the student discovers s/he has lost focus many minutes after the event. All of that time is lost. Establishing the attention span is good early training that will eventually habituate the student with ADD to the idea of starting where s/he left off.

### **Refocus**

Focus can be maintained and continued in a variety of ways. With the timer set, the student can move from location to location during the study session. While studying, the student can highlight and write in the margins to make meaningful links between what is being learned and what is already known. These mindful links become a key to maintaining focus and later accessing information. Mindfulness, remember, is a purposeful application of the understanding of the here and now.

Students should be reminded that there is no time limit (long or short) for studying. As long as a student is mindful of when and where s/he is and has some control over his or her ability to focus, even five minutes of study will serve a purpose. During longer periods of studying, frequent refocusing exercises (moving, resetting the timer, drinking or eating, snapping the rubber band, etc.) will help the student to focus. It might also be beneficial to chunk smaller bits of information together (to find a common phrase or function that will link ideas) to make memorization easier. One can see that mindful refocused attention will help the student to later access information because synthesis (the chunking) has already begun during study.

Since students with ADD frequently have difficulty finishing an assignment, a tutor might offer suggestions about how to better manage time. Some suggestions could include having students make a check list of their assignments and other chores, so they can cross them off once completed. Another suggestion could be to prioritize assignments by determining which are due first, which are the hardest, which are necessary for an upcoming test, etc. Once a student gets the hang of using a plan for completing his or her work, it becomes easier and more natural to use a planner; as a result, assignments have a better chance of being completed on time. Those “to

do” lists ensure that everything gets done. However, a student also has to be patient and understand that this change in behavior is not going to happen overnight; it will take time to accomplish.

Two of the most popular techniques for refocusing are using a rubber band as a stimulus and coming up for air or getting away from the table. The rubber band is just a conditioning prop that a person can wear on his or her wrist. Whenever the individual becomes aware that s/he has lost focus or is on the verge of losing focus, all s/he has to do is snap the rubber band against his or her wrist. Initially, the student will have to make a conscious effort to remember to snap the rubber band. Later, as refocusing becomes a more common behavior, the individual will be able to refocus without snapping the rubber band, although wearing it during stressful situations such as tests may continue to be helpful. A second refocusing technique—getting away from the table—is just a method the student can use to move, to change perspective, to get some fresh air and to use the surrounding environment to help the brain settle and refocus on the studies. It offers a relaxing physical interlude.

### **Reformat**

Reformatting is merely changing the way one looks at the material. Many students with ADD have a hard time reading a textbook because it is difficult to pull relevant information out of a paragraph. Information (bolded words and their definitions, for example) can be pulled out and put on flash cards, flow charts, diagrams (with labels) or tables. Many students with ADD struggle with this concept at first, but later find one or two graphic organizers they are comfortable using. The change in perception requires that the brain refocus—or, in some cases, focus fully for the first time. Manipulating ideas into relevant graphic representations is an excellent way to learn and retain information. One might also suggest they read the information aloud to hear it.

### **Testing Techniques for Successful Focus**

Testing and other assessments are the hallmark of the educational system and are also the place where many students with ADD do not succeed because there is simply too much pressure at one time to focus. For tests, tutors can recommend that students with ADD make sure to bring their rubber band. Remember, this is a prop for

them to use to help them refocus. Tutors can suggest snapping the rubber band before each question and during any question that seems more difficult than others. The actual snap does nothing but prompt the brain to focus.

Students might also benefit from writing down any information they think might be difficult to remember during the test—a brain dump of information. This technique will allow students to focus on other specific details with less stress because they know some of the more difficult stuff is already on the test paper waiting to be used.

Finally, tutors can suggest that to help focus on more difficult questions, the student can cover the rest of the page to isolate the one question from the others. This technique serves two functions: it eliminates distractions that might be confusing, and it brings into clear focus precisely that one question, making it easier to answer.

### **One Example**

Student D first came for assistance during his first semester of college; he was failing all five of his courses. He was in his early thirties and was worried he could not function academically. He was easily distracted and frequently interrupted the flow of our conversation. Throughout the interview, the student was offered a number of suggestions about changing behaviors in order to learn better and about the primary importance of losing the baggage of past failures. The student tried a number of techniques. Some worked. Some didn't. He started wearing a rubber band, actively engaged in his learning, and continued to come back for more consultations, still wearing his rubber band. He made check lists, used a planner and adopted tables and flow charts to reorganize his work. At the end of the semester, he made the President's list (earning four A's and one A-); since that time, he has made the President's list every semester. His attitude about learning and education had changed to the point where his measure of academic success was no longer the grade he earned but the knowledge and understanding he gained from the learning.

### **Conclusion**

Cognitive feedback techniques are valuable tools for all students who seek to improve their ability to learn. For the student with ADD, learning how to learn means coming to terms with his or her disability, finding new ways to study, and establishing new learning

habits. Cognitive feedback techniques can help the student become more aware of the nature of his or her disability and bring motivation to approach learning in a different, more effective way. With more productive learning habits, the student's attitude about studying may become more positive and allow him to enjoy the experience of academic success.

### References

- Bloom, B., S. (1956). *Taxonomy of educational objectives, handbook: The cognitive domain*. New York: David McKay Co. Inc.
- Crick, F. C. and Koch, C. (2005). What is the function of the claustrum? *Philosophical Transactions of the Royal Society B*. 360, 1271-1279, doi: 10.1098/rstb.2005.1661. Published online 29 June 2005.
- Doidge, N. (2007). *The Brain That Changes Itself: Stories of Personal Triumph from the Frontiers of Brain Science*. New York: Penguin Books.
- Dzubak, C. (2008). "Multitasking: The good, the bad, and the unknown." *Synergy: The Journal of the Association for the Tutoring Profession*. [http://www.myatp.org/ejournal.htm#Multitasking:%C2%A0\\_The\\_good,\\_the\\_bad,\\_and\\_the\\_unknown\\_Accessed\\_October,\\_2011](http://www.myatp.org/ejournal.htm#Multitasking:%C2%A0_The_good,_the_bad,_and_the_unknown_Accessed_October,_2011).
- Goldstein, E. (2010). Why much of recent neuroscience research is a waste of money. *Mindfulness & Psychotherapy*. <http://blogs.psychcentral.com/mindfulness/2010/07/why-recent-neuroscience-research-is-a-waste-of-money/> Accessed January, 2012.
- Jacobs, C. and Wendel, I. Ph.D., MSCP. (2011). Adult ADD/ADHD. <http://www.netplaces.com/adult-add-adhd/searching-for-causes/five-current-theories.htm> Accessed August, 2011.
- Kandel, E. (2006). *In Search of Memory: The Emergence of a New Science of Mind*. New York: W.W. Norton.

Merzenich, M. (2011). *On the brain*. <http://merzenich.positscience.com/>

Nazari, M. A., Querne, L., De Broca, A. and Berquin, P. (2011). Effectiveness of EEG biofeedback as compared with methylphenidate in the treatment of attention-deficit/hyperactivity disorder: A clinical outcome study. *Neuroscience & Medicine*, 2011, 2, 78-86 doi:10.4236/nm.2011.22012 Published Online June 2011 (<http://www.SciRP.org/journal/nm>) Accessed August 2011.

Osterweil, N. (2007). Ritalin may alter chemistry of young brains.” MedPage Today Published: July 20, 2007. Accessed: September 2011. [http://www.medpagetoday.com/psychiatry/adhd-ad-d/6213?xid=ob\\_cc\\_ADHD](http://www.medpagetoday.com/psychiatry/adhd-ad-d/6213?xid=ob_cc_ADHD)

Schwartz, Jeffery and Sharon Begley. (2002). *The Mind and the Brain: Neuroplasticity and the Power of Mental Force*. New York: Harper-Collins.

Valkenburg, J. (2010). “Against the grain: An argument for using less technology in education.” *Synergy: The Journal of the Association for the Tutoring Profession*. [http://www.myatp.org/Synergy\\_1/Syn\\_13.pdf](http://www.myatp.org/Synergy_1/Syn_13.pdf)

Zull, J. E. (2002). *The Art of Changing the Brain: Enriching the Practice of Teaching by Exploring the Biology of Learning*. Sterling, Virginia: Stylus Publishing.

# Does the Use of Appreciative Advising Work?

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## Abstract

This paper will discuss the results of a survey completed by students who were on academic warning and agreed to attend advising sessions. The format of the advising sessions focused on the 4 D's of Appreciative Advising with a requirement of three advising sessions and a follow-up survey. The goal of the research was to determine if Appreciative Advising could be used as a student retention model. This paper will provide the reader with what Appreciative Advising is, how it is incorporated into the advising process, and the results of student's perception of the process through the use of an assessment.

**A**ccording to Webster (Merriam-Webster's Collegiate Dictionary, 1993):

*Ap pre ci ate* - value, prize imply, holding a person or thing in high regard

*Ad vice* - a recommendation offered as a guide to action

Appreciative Advising is supportive, positive, dynamic and holistic. It is designed to assist all students by changing their negative thinking pattern (if necessary), while assisting them to find what is the best of what was and what can be, through a positive interaction with an academic advisor. According to Crockett (1985), academic advising is the one system that is required by all students which has the potential to enhance student retention (organizationally).

## Appreciative Advising

Vincent Tinto (1986, 1995), proposed a multivariate model

of student retention to explain student departure from college prior to graduation. In his model, Tinto includes a comprehensive set of demographic, cognitive, psychosocial, psychological and institutional factors. He also writes about the blending of the social and academic environments between the student and the campus. It is this blending of the social and academic environments where the academic advising through the use of the appreciative model can have a profound impact. The appreciative model can assist in the development of a campus connection, linking the student with a member of the campus community. Appreciative advising is a model which includes mechanisms and processes which allow an approach to the student to occur in a positive and inviting manner. It allows the advisor to assist his or her students by integrating them into the higher education experience, enhancing their self-esteem, modifying their locus of control and motivating them through the use of Socratic dialog. Appreciative Advising assists in shifting the advisor role from viewing the at-risk student in a “deficit” model (what the student does not have) to a “sufficient or positive” model (what the student has or can do).

### **Assisting the At-risk Student**

It is believed that all students can be positively affected by Appreciative Advising; it is the at-risk student who can probably benefit most. Quinnan (1997) defines the “at-risk” student as one who “is poorly equipped to perform up to academic standards.” Although Quinnan’s population was the adult learner, it can be applied to the general student population, in that the “at-risk students can include characteristics such as low socio-economic status, academically underprepared, undeclared or lacking a major, first generation, lacking study skills, from a single parent family, an older sibling dropped out of school, had average grades of “C” or lower from eighth to eleventh grade, repeated a grade, or lacking an academic goal (Truschel and Francois, 2005).

The use of Appreciative Advising can be related to the earlier research by Seligman (1975) who coined the term “learned helplessness,” which was later changed to “learned optimism.” The former includes students who have an external locus of control and a belief that they have no influence over their own destiny. The result can be



a lack of confidence and diminished autonomy. Grimes (1997) states that some students use learned helplessness as a self-defense mechanism to view positive outcomes as internal and negative outcomes as external. This deficit process does not assist the students to see their contributions and successes. Much in the way in which Seligman shifted from “learned helplessness” to “learned optimism,” we must shift from the usual “deficit thinking” to a “sufficient thinking” advising model.

### **Elements of Appreciative Advising**

Using Appreciative Advising in an academic setting allows the advisor to use an enhanced form of the problem-solving paradigm. The advisor does not look at the student as though something is broken, wrong, or just not working appropriately. The advisor should approach the student in a positive manner and use supportive language to draw out or accentuate the many successes the student has experienced thus far.

The advising process includes an introductory phase used to determine the appreciative topic around which the inquiry will be focused. The advisor should ask their students to indicate what is important to them and what achievements bear them most pride. According to Cooperrider and Whitney (2000), it is important to first look at the best of “What Was” or “What Is” instead of seeing a problem. This is the beginning of what Cooperrider describes as the 4-D cycle, or the “Discovery phase”. According to Paddock (2003), the “Discovery phase” has 2 sub-steps. The first is the development of affirmative and positive questions. The questions should elicit stories about times when the student was successful. The questions should focus on the students to consider the unique strengths and values they possess. The second sub-step (also called the Dream Phase) directs students to consider their future. They should be asked to think about what their future can look like (in a successful mode), and how they can make their thoughts or dreams into reality. Creating an opportunity for positive dialogue is critical at this stage rather trying to analyze the cause of students’ problems. The students should be asked what they want to see in their futures (as a core theme). The dream images will be translated into a positive and a present tense action plan. The power of this activity is that the students see the

product of their dream and they integrate it into their next steps.

Next, is the “Design phase,” which is an integration of what the students wishes or dreams will occur in the future, also known as the goal or plan. The “Design phase” flows from the “Dream phase” with careful consideration and analysis of what can be achieved. This is when students focus on what they can do to enhance their academic strengths rather than what is customarily done such as analyzing the problems. The students will begin to lay a foundation to move toward success, creating their plans for the future.

According to Truschel (2007), the final or “Destiny phase,” is the point where the student takes action on the plan they developed. During this stage, students should try to imagine their future in a positive manner and begin to move their plans or goals into actions. The advisor should be aware that students often drift back to their previous failures and therefore, should be coached to leave their past failures behind while focusing on their potential for success.

Appreciative Advising is positive and action-oriented. The advisor and the student should form a working alliance. This alliance will allow the advisor to interview the students in order to learn what is important in their lives. This will then become the appreciative topic from which the dialog will focus. During the interview process, it is important to get a complete description of what positive experience the students had in their past which can then be related to present issues. According to Adams, Schiller and Cooperrider (2004), the subject of question asking is primary and universal; it is fundamental to any consideration about the ways we human beings perceive, think, feel and make meaning. Questions are also at the core of how we listen, behave and relate as individuals. Virtually everything we think and do is generated by questions.

A set of interview questions (located in the appendices), which were developed to be affirming and thought-provoking, were used to support of the Appreciative Advising effort. During the initial advising session, it is important to put the student at ease by making him/her feel as comfortable as possible. As the interview proceeds, it is important to accent the positive attributes, and if the conversation drifts to negative attributes, the conversation should be redirected to the strengths the person possesses as soon as the conversation allows.

The advisor should maintain a working alliance and focus on developing trust and expressing genuine concern for the student's success. The advisor should ask their students important questions openly and objectively, with no special attitude or opinion presented (Giorgi, 1985).

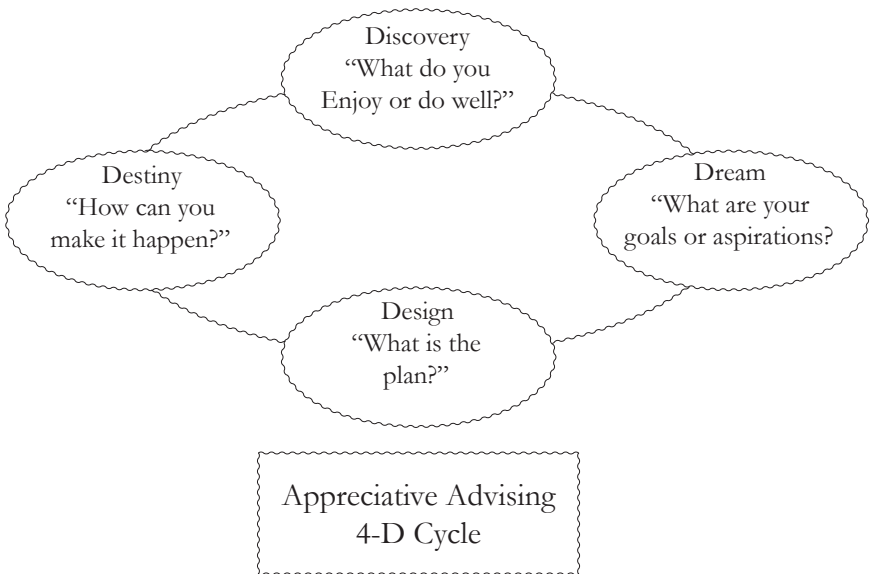


Figure 1. The 4 D Cycle of Appreciative Advising by J. Truschel. Retrieved July 25, 2008, from *The Mentor*: <http://www.psu.edu/dus/mentor>.

As part of the Appreciative Process, it is important to acknowledge and affirm the meeting by sending a brief note (paper or email) which is designed to thank students for seeing the advisor and if possible to synthesize their agreed upon goals. Although this takes time, it is extremely useful because it supports the working alliance, lets the students visually see the conversation, continues to establish rapport and supports their positive position on their plan.

Once the Discovery phase is complete and the working alliance established, it is important to work through the next phases in rapid succession, moving the locus of control from the advisor to the student. The advisor should ask the student to envision what might be, in a positive manner, asking the student to first verbalize this and then put it in writing. The student should integrate his/her wishes for the future using strengths and previous achievements. Once this is

accomplished, the student should be asked to move his/her plan of the design into action, by the advisor asking the student about his/her future.

### **Methodology**

This research study examined what the at-risk undeclared population, felt after they received advising related to having a quality point average less than a 2.0 and being placed on academic warning. To explore these variables, an Appreciative Advising Instrument was developed which consisted of four subscales: self-efficacy, self esteem, motivation and commitment to the positive process. The 15 items used an ordinal scale for rating. These measures were administered to 112 college students at a Comprehensive Public Regional University.

### **Participants**

Participants were students who obtained less than a 2.0 quality point average and had less than 30 earned college credits. Students were sent a letter indicating their academic status and were invited to a meeting with their academic advisors during the first two weeks of the fall 2006 and spring 2007 semesters. This study population consisted of a total of 112 students (58 from the fall 2006 semester and 54 students from the spring 2007 semester) and included second and third semester students who were currently enrolled at the university. Participation in the study was completely voluntary.

The participants were advised about the nature of the study and were permitted to decline participation at any time. There was no identifying information such as name, social security number, student number, address or phone number requested as part of this research.

Students were advised three times during the first five weeks of the semester. The first session focused on developing a working alliance with the student and the use of the Discovery phase which allowed for the identification of the student's positive life themes. The second meeting included the Dream and Design phase. This included developing provocative questions for the future using questions such as: "What might be?" or "What are the possibilities?" Then the students were asked to develop a plan for their future. The students were asked to focus on a vision that was realistic, rooted in strengths. The third and final meeting included the "Destiny phase". This is

when the students discussed the plan they implement concerning their vision of the future - "What will be?"

### **Instrument**

The Appreciative Advising Instrument was designed to measure the student's perception of traits such as self-efficacy, self-esteem, motivation and commitment to the positive process. According to Cooperider and Whitney (n.d.), appreciative inquiry is the cooperative search for the best in people, their organizations and the world around them. It involves systematic discovery of what gives a system "life" when it is most effective and capable in economic, ecological, and human terms. The instrument was designed to determine a student's belief during the discovery phase by looking at their affective characteristics. In addition to the instruments questions, students were asked to write anecdotal information on the reverse side of the questionnaire. Questions used during the advising process are located at the end of this article. Each interview was unique in terms of the probing or clarifying questions which were asked in order to draw out a full description in the Discovery phase. When beginning this, it is important for the advisor to "set aside predilections, prejudices, predispositions, and allow the information as if it were for the first time" (Moustakas, 1994).

The students were requested to complete survey questions after they concluded with the third and final advising session. They were asked to drop the survey off at their leisure in a drop box which was located in neutral area which was not in sight of the advisors office. The surveys were collected by a faculty colleague and scored. The assessment included 15 items which used an ordinal scale of "1" meaning "Strongly disagree", "2" meaning "Disagree", "3" meaning "Neutral", "4" meaning "Agree" and "5" meaning "Strongly agree". Students were also asked to provide additional comments. The instruction on the assessment form stated: "In order to determine if this approach to academic advising is effective, it would be appreciated to obtain your comments. Please tell me how you feel and make any recommendation(s) that you feel would improve the advising experience".

### **Results**

The study received overwhelmingly positive results from the

survey and positive anecdotal comments from the participating students. The results are provided in Table 1.

Questions asked	Mean
I believe I have the ability to take care of the academic issues I encounter.	4.5
I am competent enough to make sure that my future academic performance will be successful.	4.6
I now have the skills and ability to ensure excellent academic performance for myself.	4.6
I believe that I can handle my academic needs.	4.5
I have a sense of self-pride from my past academic successes.	4.6
How well I perform academically is a matter of my own ability.	4.5
I have positive feelings about the way I approach my own academic performance.	4.3
I now feel good about methods to cope with my academic needs.	4.3
My advisor listens to me and made me aware of my strengths to achieve academically.	4.5
My advisor helped me to refocus my efforts from negative to positive feelings about my abilities to succeed.	4.4
I will not hesitate to ask my advisor for academic performance assistance.	4.9

My academic performance is determined largely by what I do (and don't do).	4.9
I am very motivated to do well in my academic studies.	4.8
I am strongly motivated to devote time and effort to academic success.	4.67
I have a strong desire to succeed in school.	4.59
It is really important to me that I do well in my academic performance.	4.98
Overall, I rate the quality of this advisement experience as excellent.	4.81

Students were asked to provide additional comments about the advising experience. Although there were not a significant number of comments made, those that were made were also very positive. Students reported the following:

- I thought I was going to get yelled at... thanks!!
- I did not feel very good to start out, but I liked the thought that I was good as stuff before ESU so, why can't I be good at ESU!
- Believe it or not, it really helped, thanks.
- I know I did not apply myself, but I am sure going to try now.
- My parents almost killed me, thanks for a second chance.
- My grades in HS were great, what happened?
- I feel like the little engine that could, toot toot, I will!!
- Thanks for listening to me, it meant a lot.
- Ok, I'm not sure why, but I feel better.
- I know there is someone out there that believes in me.
- I will make everyone proud this semester.
- I am happy to finally find an advisor that wants to help me, the last guy yelled and made me feel like crap.
- I hate general education classes

- I know what to do, I have a tutor and will do well.
- I wish my parents listened like this guy.

## Discussion

In response to the research question, it appears that students had positively responded to the first step or the Discovery phase of the appreciative advising process. The overall rating and anecdotal comments overwhelmingly support this approach. There were a few responses (4) which received Neutral as the lowest rating.

The appreciative advising process was somewhat difficult to research because each student and interview is decidedly different. For example, student “A” may deny any real academic problems other than a lack of commitment to the learning process, where as student “B” would take full blame and believe that he/she did not have the cognitive capability to succeed in college. The result is that each student would be asked very different affirming questions, making the process, for the most part, unique to each student. The items that were exactly the same include the assessment instrument and the pool of questions which were developed in advance of the advising sessions.

The appreciative process was very time consuming and work intensive. The students were advised three times during the first five weeks of the semester. Although this is viewed as positive, it is difficult to accomplish this when there are additional responsibilities as well as students who require attention. The at-risk sample population responded positively to this style of advising with 105 of the 112 students making and keeping all of the appointments.

On a personal level, this researcher felt uplifted and more positive as a result of the affirming interactions with the student. At the end of a busy day, there was a sense of accomplishment and positive self worth with more available energy than there had been when advising the student in a negative (deficit) manner. The appreciative advising process places the burden and positive experience on the students who ultimately have control and responsibility of their academic experience.

As a study limitation, there were 146 students who were initially invited to participate in the research study with a total of 112 accept-



ing by attending the first session. This self-selection is a variable that influenced the study, since participating students are possibly more concerned about their academic status and are more motivated to engage in the advising process.

It is believed that this positive form of interacting with students should be incorporated into learning assistance centers, since it appears that the at-risk student as well as staff can derive some benefits from this approach. Administrators, faculty, staff and tutors could benefit from learning more about the appreciative approach by incorporating the 4-D cycle in a comprehensive training program.

### **Future Research**

It would be beneficial to determine if the students that completed the Appreciative Advising sessions did in fact accomplish their goals to get off academic warning or probation. This would have required the students to identify themselves on the survey instrument which, was not done. It would also have been beneficial to determine if there were particular circumstances which may have had a negative impact on the student's academic progress, such as health, money etc. I would recommend that future research which uses an Appreciative Advising Survey include a minimum of demographic information to include name, student number, gender, number of hours working, number of hours studying, socioeconomic status and whether the student is a first generation college student, in order to obtain better demographic information about the student as well as to have the ability to track student's academic progress.

It would have been beneficial to have a control group of at-risk students did not receive Appreciative Advising, in order to determine if there was a significant difference between student groups.

### **References**

- Adams, M. G., Schiller, M. & Cooperrider, D. L. (2004). With our questions we make the world. In Cooperrider, D. L. and Avital, M. (Eds.), *Constructive discourse and human organization*. Amsterdam, The Netherlands: Elsevier Press.
- Cooperrider, D. & Whitney, D. (n.d.). *Appreciative Inquiry, part of the Collaborating for Change*. Retrieved January 15, 2008, from <http://>

thinksmart.typepad.com/convergence\_2004/2004/06/david\_cooperrid

- Cooperrider, D. & Whitney, D. (2000). A Positive Revolution in Change: Appreciative Inquiry. In D. L. Cooperrider, P. Sorensen Jr., D. Whitney and T. F. Yaeger, (Eds.), *Appreciative Inquiry: Rethinking human organization toward a positive theory of change* (pp. 3-27). Champaign, IL: Stipes Publishing.
- Crockett, D. S. (1985). Academic advising. In L. Noel, R. Levitz, D. Saluri, & Assoc. (Eds.), *Increasing student retention* (pp. 244-263). San Francisco: Jossey-Bass
- Giorgi, A. (Ed.). (1985). *Phenomenology and psychological research*. Pittsburgh, PA: Duquesne University Press.
- Grimes, S. K. (1997). Underprepared community college students: Characteristics, persistence, and academic success. *Community College Journal of Research & Practice*, 21(1), 47-57.
- Merriam-Webster's Collegiate Dictionary* (10th ed.). (1993). Springfield, MA: Merriam-Webster.
- Moustakas, C. (1994). *Phenomenological research methods*. Thousand Oaks, CA: Sage Publications.
- Paddock, S. S. (2003). *Appreciative Inquiry in the Catholic Church*. Plano, Texas: Think Book Publishing Company.
- Quinnan, T. W. (1997). *Adult students "At-Risk": Culture bias in higher education*. In H.A. Giroux and P. Friere (Series Eds.), *Critical Studies in Education Series*. Westport: Bergin & Garvey.
- Seligman, M. E. P. (1975). *Helplessness: On depressions, development, and death*. San Francisco: W.H. Freeman.
- Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student*

*attrition* (2nd ed.). Chicago: University of Chicago Press.

Tinto, V (1982), Limits of theory and practice in student attrition. *Journal of Higher Education*, 53(6), 687-700.

Truschel, J. & Francois, G. (2005, October). *Bet the PASS Line: Increase Retention and Student Success*. Paper presented at the 2005 National Academic Advising Association Conference., Las Vegas, NV.

Truschel, J. (2007, July 6). Using appreciative inquiry in advising at-risk students: Moving from challenge to success. *The Mentor: An Academic Advising Journal*, 9(3). Retrieved July 25, 2008, from <http://www.psu.edu/dus/mentor>.

## **Appendix A**

### **Appreciative Inquiry Advising Questions**

Tell me about a time when...(frame from a positive experience).

Think back through your experiences since grade school or high school and tell me what your favorite class was. Why was it your favorite class?

While in college, describe the situation that you felt best about.

Describe a time when you enjoyed being in school. What were the circumstances during that time?

Describe a time when you were proud about a class project. Why were you proud?

What do you value most about being in college?

If you could make 3 wishes for the future, what would they be?

What skills did you use successfully that could be applied to the current challenges?

What did you learn from that experience that would be effective here?

What would you like to have more of?

What would you like to do differently?

What made \_\_\_\_\_ so exciting, meaningful, satisfying?

How can I help?

How can I support you?

## Appendix B SAMPLE

### Appreciative Inquiry Assessment

Please take a few minutes to complete this form.

Strongly Agree   Agree   Neutral   Disagree   Strongly disagree

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I believe that I have the ability to take care of the academic issues I may encounter.					
I am competent enough to make sure that my future academic performance will be successful.					
I now have the skills and ability to ensure excellent academic performance for myself.					
I believe that I can handle my academic needs.					
I have a sense of self-pride from my past academic successes.					
How well I perform academically is a matter of my own ability.					
I have positive feelings about the way I approach my own academic performance.					
I feel good about methods I have to cope with my academic needs.					
My advisor listens to me and made me aware of my strengths to achieve academically.					

My advisor helped me to refocus my efforts from negative to positive feelings about my ability to succeed.					
I will not hesitate to ask my advisor for academic performance assistance.					
My academic performance is determined largely by what I do (and don't do).					
I am very motivated to do well in my academic studies.					
I am strongly motivated to devote time and effort to academic success.					
I have a strong desire to succeed in school.					
It is really important to me that I do well in my academic performance.					
Overall, I believe that the quality of this advisement experience was excellent.					

In order to determine if this approach to academic advising is effective, it would be appreciated to obtain your comments. Please tell me how you feel and make any recommendation(s) that you feel would improve the “advising experience”.

**PLEASE DEPOSIT THIS FORM IN THE SURVEY BOX**

Thank you for participating in this survey

# Using the Scientific Method to Improve Mentoring

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Sandra McGuire

## Abstract

Many students who enter colleges and universities seem to be focused on memorizing and regurgitating information rather than on developing critical thinking and problem solving skills. Mentoring is crucial to help these students transition from the current approach to one that will be successful in college. Successful mentoring requires a structured approach. The scientific method can serve as the model for such an approach. An important component of successful mentoring involves teaching students about the learning process and teaching them effective learning strategies. Specific characteristics of mentors and protégés will determine whether the mentoring is effective or not.

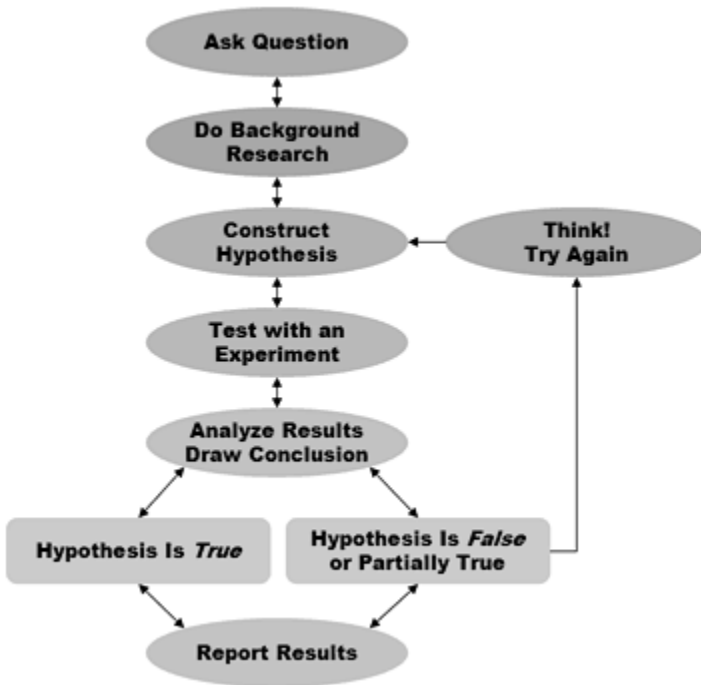
## Introduction

Mentoring is a well-established practice for helping individuals successfully negotiate new or unfamiliar territory. There are numerous mentoring programs operating in academic, corporate, and social settings. The role of the mentor is to help the protégé develop habits and attitudes that will allow the protégé to attain a much higher level of success than would have been the case without the mentoring. I have witnessed the significant impact of mentoring throughout the course of my thirty-five year career as a chemical educator and learning center administrator. In most cases I have seen mentors make a significant and positive impact on student performance. However, in some cases the impact has been negative and has caused protégés to abandon their career goals. When the mentoring is done in a structured manner, based on specific princi-

ples and guidelines, the prognosis for a positive outcome is excellent. When the scientific method is used as a framework for structured mentoring, the results are very likely to be positive for both the protégé and the mentor.

### The Scientific Method

The scientific method provides a standard protocol for asking questions and conducting experiments to find answers to the questions. A schematic of the scientific process, as shown on the website: [www.sciencebuddies.org](http://www.sciencebuddies.org), is shown below:



Source: [http://www.sciencebuddies.org/mentoring/project\\_scientific\\_method.shtml](http://www.sciencebuddies.org/mentoring/project_scientific_method.shtml)

### Applying the Scientific Method to Mentoring Asking the Question

The fundamental question that must be answered when entering a mentoring relationship is: “How can I be the most effective mentor for this particular protégé?” The emphasis is on the particular protégé because all students are different. They come from



different academic backgrounds, different cultures, different family situations, different past experiences with mentors, and many other different situations. Mentors can be effective only if they know as much about the protégé as possible without delving into areas that the protégé might consider too personal.

### **Do Background Research**

Background research will yield information about the protégé's characteristics that will be very valuable in the mentoring sessions.

Some of the characteristics that will be helpful to the mentor are listed below:

- A. Preferred learning style: verbal, auditory, read/write, or kinesthetic
- B. Personality style: Myers-Briggs personality profile characteristics
- C. Cerebral Hemisphericity: Preference for right-brain or left-brain activities
- D. Career Interests: research, teaching, health career, etc.
- E. Cultural Background: minority or majority, urban or rural, socioeconomic status, etc.

In most cases, the protégé will not know his or her learning style, personality style, or cerebral hemisphericity preference, but this can easily be determined by having the protégé take a learning style diagnostic test that is available at a number of websites, including *[withheld for blind review]*. The mentor should also take the diagnostic tests so that s/he will better understand how the mentor and protégé are alike or different in styles and preferences.

In addition to knowing the characteristics of the protégé, the mentor must determine the protégé's expectations of the mentoring experience. For example, a protégé who expects to be told what to do by a mentor will want a different kind of mentoring experience from the protégé who expects the mentor to help the protégé brainstorm several options that the protégé has constructed on his or her own. The mentor will need to gently move all students toward a position of self-sufficiency, but the initial encounter will be different based on the student's initial expectations. The mentoring philosophy at

the Center for Academic Success is that protégés are adults who are capable of making sound decisions about their behaviors and activities when provided with strategies to develop choice. Mentors should guide students in developing a menu of choices and help them select the best alternative for a specific situation.

### **Construct Hypothesis**

If the protégé is having some difficulty in school, which is often the case when a protégé contacts a mentor, there are several possible causes, resulting in a number of hypotheses that can be considered. Although several factors might be responsible for the academic difficulty the protégé is experiencing, each one should be explored separately.

- A. The protégé needs more effective learning and study strategies
- B. The protégé needs strategies to deal with personal problems such as financial problems, relationship issues, etc.
- C. The protégé needs a confidence boosting session to be assured that s/he can successfully negotiate the task at hand
- D. The protégé needs organization and time management strategies

In my varied experiences with proteges, I have found that by far the number one cause of academic difficulty is hypothesis A above; the protégé needs more effective learning and study strategies. Therefore, this is the one that is the focus of the experiment that I perform.

### **Test with an Experiment**

In order to test whether a lack of learning and study strategies is really the problem, the experiment I perform involves providing information on the learning process and on very specific strategies that can be used to improve learning. Information is also provided on how to access other campus resources such as tutorial centers, instructor's office hours, the Office of Career Services, and the campus Health Center. During subsequent visits the protégé and I examine which actions produced positive results. If the student's performance improves as a result of this information, the hypothesis is supported. If the student's performance does not improve, I test another hy-

pothesis.

## **Learning and Study Strategies Information**

### **Teaching Students the Difference between Studying and Learning**

Because many students enter college without knowing how to learn or how to study, the Center for Academic Success conducts workshops with groups of entering first year students to help them begin shifting their primary focus from grades to learning. When these students are asked to explain the difference between studying and learning, most stated the most common response is that studying involves forcing yourself to memorize uninteresting information, whereas learning would involve gaining insight into material of interest to you. They all agreed that learning is fun, but studying is tedious. They further indicated that learning could and often does happen in the absence of studying, and studying does not necessarily result in learning. It was evident during the discussion that these students had not previously reflected on the difference between studying and learning, but that after the discussion they clearly understood the difference. One student who clearly understood the difference explained it as follows. He stated that studying involves focusing on the “what”, whereas learning involves focusing on the “why”, the “how”, and the “what if”. He found that if he focused only on the “what”, he easily forgot the information. But if he focused on the “why”, “how”, and “what if”, he could retain and apply the information. This understanding of the difference between studying and learning was the first step in helping them to turn unwelcome and tedious study sessions into engaging and interesting learning sessions. And they began to understand why a greater investment of time devoted to their academics was necessary.

Teaching students about metacognition and metacognitive strategies has proven to be very effective at helping students understand why their behavior should be changed if they want to succeed academically, especially in the sciences. Metacognition involves thinking about thinking. It involves the ability to be aware of one’s self as a problem solver, to monitor and control one’s mental processing, to recognize when one is simply memorizing facts and formulas and not understanding the application of the information, and to know

that knowledge and understanding are not handed out by an instructor, but must be constructed by the learner. (See <http://www.gse.buffalo.edu/fas/shuell/cep564/Metacog.htm> for a brief overview of metacognition.) Introducing students to constructivist learning theory has also proven quite useful in helping them to develop metacognitive strategies. (See [http://carbon.cudenver.edu/~mryder/itc\\_data/constructivism.html](http://carbon.cudenver.edu/~mryder/itc_data/constructivism.html) for information on constructivist learning theory.)

The examples of four [*withheld for blind review*] students provide the evidence that when students are taught *how* to learn, their performance usually takes an immediate and dramatic turn for the better. The performance of the four students, contrasting their performance before and after being taught metacognitive strategies, is shown below. (The after performances are underlined.)

- Travis, junior psychology student  
Test scores: 47, 52, 82, 86
- Robert, freshman chemistry student  
Test scores: 42, 100, 100, 100
- Aimee, junior organic chemistry student  
Test scores: 54, 82, 76, 78
- Miriam, freshman calculus student  
Test scores: 37.5, 83, 93

When interviewed, each of these students indicated that understanding the difference between the way they had been studying before being taught metacognitive skills and the way they studied after they were taught metacognitive skills was the reason for their immediate and drastic improvement in their performance.

### **Teaching Students That Learning and Memorizing are Different**

Cognitive psychologists make a distinction between rote learning and meaningful learning (Ausubel, Novak, and Hanesian, 1978). Rote learning is verbatim memorization and is not necessarily accompanied by any understanding of the terms. Students are unable to explain information that is learned by rote, and they are not able to paraphrase the information in their own words. Meaningful learning,

on the other hand, is learning that is tied to previous knowledge, and it is understood well enough to be manipulated, paraphrased, and applied to novel situations. For example, rote learning about Charles Gas Law involves the simple memorization that the volume of a gas is directly proportional to the temperature when the pressure is held constant. Meaningful learning, on the other hand, involves relating this law to the advice to motorists to reduce the pressure in their tires when embarking on a long trip on a hot summer day. Most learning is neither completely rote nor entirely meaningful, and can be placed on a rote-meaningful learning continuum (Ausubel, 1968).

Although most students enter college not knowing the difference between rote learning and meaningful learning, when they are taught this distinction they are able to implement strategies that promote meaningful learning. When they fully understand the difference between memorizing facts and formulas for a test and working to understand the course concepts and how the concepts relate to each other, students' greater conceptual understanding and their success on problem solving tasks and examinations increases substantially.

One particularly effective way to present the different types of learning is through a discussion of the hierarchy of learning levels, shown below, similar to Bloom's taxonomy (Bloom, 1956). The difference between the representation below and Bloom's taxonomy is that the "knowledge" and "comprehension levels have been subdivided into three levels: "recall", "translation", and "interpretation".

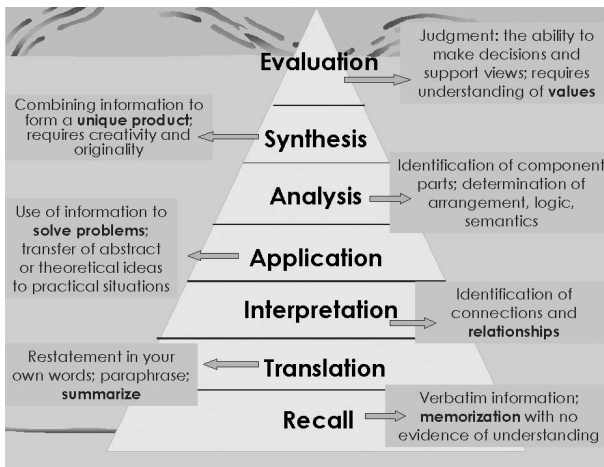


Figure 1

Although mentors generally assume that students know that memorizing information is not the same as learning, this assumption is unwarranted. Formally introducing them to differences in the levels of learning is crucial to developing the understanding of this distinction in today's students.

### **Teaching Specific Learning Strategies**

The Center for Academic Success at [withheld for blind review] has had great success teaching students to use The Study Cycle with Intense Study Sessions. The four-step process is described below.

#### **The Study Cycle**

The four steps in the Study Cycle are adapted from methods that are commonly discussed in study skills textbooks, and from a method proposed by Frank Christ. (Christ, XXXX).

*Step 1: Preview or pre-read the information that will be covered in class before class.*

Spending 10–15 minutes reviewing chapter material (concentrating on the bold-face print, italicized writing, figures, graphs, diagrams, etc.) prepares the mind to receive and comprehend the material that will be discussed in lecture. The previewing provides background knowledge for what will be covered in the lecture. Cognitive scientists have empirically demonstrated the importance of background knowledge to understanding and acquiring new information (Bransford, Brown, and Cocking, 2000).

*Step 2: Go to class, and actively participate in lecture.*

This step needs to be explicitly stated because the absenteeism in large introductory science classes is often extremely high, approaching 50% after mid-semester

*Step 3: Review and process class notes as soon after class as possible.*

Spending 10–15 minutes reviewing and reworking lecture notes shortly after the lecture provides the mechanism for the information to be transferred from short-term to long-term memory, significantly improving retention.

*Step 4: Use Intense Study Sessions.*

Intense Study Sessions are concentrated study sessions of approximately 60 minutes duration. However, they can be as short as 20 minutes or as long as 75 minutes, depending on the individual

student's need for a break. During this short, but focused, study time, a considerable amount of learning can be accomplished. The Intense Study Session consists of four segments, each of which is important for the session to have the maximum effect on learning.

- a. 2–5 minutes: Set goals for the next 40 minutes
- b. 35–38 minutes: Work to accomplish the goals that were set.
- c. 10 minutes: Review what was studied
- d. 10 minutes: Take a break

For example, a goal for an Intense Study Session in biology might be to master photosynthesis by learning the terms and the processes involved.

Most students find that The Intense Study Sessions are real “procrastination busters” – providing a means for targeted study sessions that are efficient and “doable”. Short, focused sessions are more effective than three to four hour study marathons during which there is little meaningful learning accomplished.

### **Getting the Most Out of Homework**

Many students who do well on the homework do poorly on the tests and question why they ace the homework assignments but fail the tests. The answer to this question lies in how these students do their homework assignments. The first question to ask a student in this situation is “When you do your homework, do you read the problem, flip back through the pages to find an example similar to the problem, and then do the problem based on the example?” Invariably, these students read the homework problem before reviewing the information related to the problem, look for an example, and then “work” the homework problem using the example as the model. It is my experience that this one behavior is the reason that a large number of students think they have “done the homework problems”, but that instead the examples in the book have done the homework problems. Students, however, usually see nothing wrong with this method of doing the homework problems, especially because this is the way they always did their homework in high school, and they did well in their courses there.

A simple strategy that has proven quite effective in extinguish-

ing this habit is found in the following bit of advice that mentors can give to protégés:

- When you start the homework, study the information relevant to the problems as if you will be quizzed on it. Treat the examples in the text and in the notes as homework problems.
- Read the problem statement in the example, but do not look at the answer. Work the example problem by using information learned from studying the concepts.
- When you arrive at the answer, compare your answer to the answer that is provided in the example. If your answer is the same as the answer in the example, you have probably done the problem correctly.
- Next look at how the problem was solved in the example to see if your method of solving it was identical to the method used in the example. If it is not, and you find it easier to work the problem your way continue to use your method to solve problems of that type. If you prefer the method used in the example, you can begin to use that method in the future. If you find that you have gotten a different answer than the answer that appears in the example, study the example to find the source of your error(s), and correct them.
- Continue to work on the example until you can do the problems without making errors.
- After having worked the examples this way, solve the homework problems without looking at any examples. In fact, it is quite useful to pretend that you are doing these problems for a test or a quiz.
- When finished with all of the problems that will be completed at that time, check all of the answers. This advice is particularly helpful to students who may not be aware that the answers for many assigned homework problems are provided in an Appendix in the back of the textbook. Any problems that were not solved correctly should be noted, and returned to at a later date after reviewing the relevant material. (Be sure to reread the text and your class notes on this topic; do not look only at example problems.) Some



problems may require several attempts before they can be done correctly without consulting any examples.

The process described should be repeated until all problems have been solved correctly without looking back at any examples in the text or in the class notes. When and only when all problems can be solved in this way, can students be confident that they can solve any problem that is given. With an appropriate explanation students easily understand the difference in the skill being tested on an exam and the skill they are developing by using the examples to solve the homework problems. The skill being tested is not solving a problem by using an example, but rather solving the problem using only the protégé's effort. However, when they do problems only by consulting examples, the skill they are perfecting is the skill of solving a problem by using an example as a guide. The knowledge of the difference results in students changing the way they approach their homework assignments, and they see fairly immediate increases in their understanding of concepts, problem solving skills, and test performance. Whereas it would never occur to most students on their own that looking at an example to do their homework is counterproductive to performing well in the course, they are quite receptive to trying this new way of doing the homework because they understand why it works.

After all of the strategies have been provided to the protégé, the mentor can proceed to the next step in the scientific method.

### **Analyze Results, Draw Conclusion**

If the result of providing protégés with learning and study strategies information yields an improvement in academic performance, the mentor can conclude that the hypothesis was true. If the performance does not improve, the mentor can conclude that the hypothesis may be false. (Although it is possible that even with the information the protégé did not change his or her behavior. In this case the hypothesis would be true even though the performance did not change. Motivational strategies would then need to be used.). If the hypothesis is not true, the next step in the scientific method must be implemented.

### **Think! Try Again**

If the hypothesis proved to be false, the mentor can then propose an alternate hypothesis. For example, time management and organizational skills may be the problem. The protégé can then be directed to use time management tools such as weekly calendars, semester calendars, “to do” lists, etc. Whether the hypothesis was true or false, the mentor must report the results so that other mentors will have effective strategies to use with their own protégés. Mentors should not shy away from future use of strategies that proved ineffective with one protégé. The strategy that was ineffective with protégés with one set of personal characteristics may be very effective with a group of protégés with different characteristics.

### **Report Results**

The results should be reported to a wide variety of audiences in a number of different forums. For example, results can be reported to the other faculty members in the department, to other faculty at the institution, at national conferences, and in newsletters and journals. When mentors have specific strategies to use with protégés, the likelihood of a successful mentoring experience is greatly enhanced.

### **Behaviors of Successful Mentors and Protégés**

Mentors should always be cognizant that the protégé has different characteristics, skills, interests, and goals than the mentor. Mentors should be prepared to listen more than talk, and be willing to brainstorm ideas with the protégé. Additionally mentors should always communicate high expectations, but always be prepared to help proteges deal with setbacks. And most importantly, the mentor should know when and whom to call if the situation requires outside intervention. For example, if a protégé exhibits signs of physical or psychological illness, the mentor should direct the student to a health professional on campus. Proteges should recognize that the mentor has experience and knowledge that will be beneficial, and should approach each mentoring session with an eager and open mind. Proteges should also be willing to challenge the mentor on advice with which the protégé respectfully disagrees.

Several mentor and protégé behaviors have been linked with successful mentoring. Murray and Owen (1991) identify the behaviors linked with success mentoring as follows:

### **Behaviors of Successful Mentors**

- A. Act as a source of information on the culture, norms, and expected behaviors
- B. Tutor specific skills, provide effective strategies
- C. Give feedback and provide coaching
- D. Serve as a confidante in personal crises and problems, where appropriate
- E. Demonstrate confidence in protégé's ability
- F. Assist protégé in plotting a career path
- G. Let protégés make their own decisions
- H. Maintain the integrity of the relationship between the protégé and the protégé's natural supervisor

There are also a number of behaviors that are associated with unsuccessful mentors, which are delineated below.

### **Behaviors of Unsuccessful Mentors**

- A. Controlling and manipulative
- B. Self-centered
- C. Legend in their Own Mind
- D. Lack respect for protégé's intelligence and ability
- E. Use personal information to undermine protégé
- F. Take credit for protégé's work
- G. Unwilling to remain on a professional level with protégé

While certain behaviors can be attributed to successful and unsuccessful mentors, there are also protégé behaviors that will impact the success of the mentoring experience. These are listed below.

### **Behaviors of Successful Protégés**

- A. Interested in receiving advice
- B. Receptive to constructive criticism
- C. Spend time preparing for mentoring session
- D. Unafraid of asking probing questions

### **Behaviors of Unsuccessful Protégés**

- A. Regularly miss appointments
- B. Fail to heed advice
- C. Refuse to take responsibility for their actions
- D. Generally have an unenthusiastic and negative attitude
- E. Rarely, if ever, express appreciation
- F. Fail to give credit to the mentor for his/her assistance

### Broader Implications

The application of the scientific method to mentoring activities is applicable to all academic areas – not just the sciences. Although my mentoring activities primarily involve students in the areas of science, technology, engineering, and mathematics, other faculty members at the Center for Academic Success mentor protégés in a wide variety of disciplines. The steps involved in applying the scientific method to mentoring are generally applicable to any mentoring experience. Learning about the characteristics of the protégé, developing hypotheses about the problem to be addressed, jointly developing a menu of strategies, implementing the strategies, analyzing the success, developing conclusions about the efficacy of specific strategies, and subsequently modifying strategies based on the results will make the mentoring experience an enjoyable and satisfying one for both the protégé and the mentor. The broad applicability of these methods suggest that they can be used for students in all types of institutions and at all levels. The specifics of the mentoring experience will change, but the basic framework is sufficiently robust that, when applied according to the scientific method, will yield positive results in any mentoring situation.

### Conclusion

The steps in the scientific method provide an excellent framework for successful mentoring activities. Increasing the numbers of students who are interested in pursuing careers in the sciences, technology, engineering, and mathematics will require improved mentoring to keep more students in the pipeline. The principles and strategies outlined above should prove useful for everyone who wants to significantly improve the impact of their mentoring activities on students.

### References

- Ausubel, D.P., Novak, J., & Hanesian, H. (1978). *Psychology: A cognitive view*. New York, NY: Holt, Rinehart, and Winston.
- Bloom, B.S. (Ed.), (1956). *Taxonomy of educational objectives. The classification of educational goals*. Handbook I: Cognitive domain. New York, NY: David McKay.

- Bruer, John T. , 2000. *Schools For Thought: A Science of Learning in the Classroom*. Cambridge, MA: MIT Press.
- Bransford, J.D., Brown, A.L., Cocking, R.R. (Eds.), 2000. *How people learn: Brain, Mind, Experience, and School*. Washington, DC: National Academy Press.
- Fisher, K.M., Wandersee, J.H., & Moody, D.E. (2000). *Mapping biology knowledge*. Norwell, MA: Kluwer Academic Publishers.
- Halpern, D.F and Hakel, M.D. (Eds.), 2002. *Applying the Science of Learning to University Teaching and Beyond*. New York, NY: John Wiley and Sons, Inc.
- Nilson, Linda, 2004. *Teaching at It's Best: A Research-Based Resource for College Instructors*. Bolton, MA: Anker Publishing Company.
- Murray, M. and Owen, M. (1991). *Beyond the Myths of Mentoring*. San Francisco, CA: Josey-Bass.
- Peddy, S. (2001). *The Art of Mentoring: Lead, Follow, and Get Out of the Way*. Houston, TX: Bullion Books.
- Taylor, S. (1999). Better learning through better thinking: Developing students' metacognitive abilities. *Journal of College Reading and Learning*, 30(1), 34-42.
- Zull, James (2004). *The Art of Changing the Brain*. Sterling, VA: Stylus Publishing.



# Psychophysiological Measures of Learning Comfort: Study Groups' Learning Styles and Pulse Changes

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## Abstract

This study provided empirical support for tutor-led study groups using a physiological measurement and study survey data. The scope of this preliminary study included determining differences in biology and chemistry study group members' ( $N=25$ ) regarding learning styles and pulse rate changes. As hypothesized, there was significant evidence that pulse rate decreased during the sessions, suggesting less stress. Significant differences in final and initial pulse rate were found for biology students when their learning style was matched to the style of instruction. The results suggest that gearing instruction styles to students' learning styles may reduce learning stress in some cases.

Creating measurable and relevant learning outcomes is a crucial portion of education and has become an important strategic objective for higher education in addition to grade school. The trend towards outcomes assessment has implications for developing ways to more effectively facilitate instruction and learning (Johnson, 2006). Learning style refers to the compilation of preferences and abilities an individual has relating to information gathering and processing (Johnson & Orwig, 1998). Learning styles include both biological and psychological aspects of the individual (Davis & Franklin, 2004). Based on these characteristics, some learning and teaching methods are more effective for some individuals and less

effective for other individuals. Therefore, learning style is an important factor in how an individual learns and in creating and assessing learning outcomes. R. Dunn (1984) posited that teaching in a format that was consistent with a student's preferred learning style was one of the most efficient ways to customize individual instruction. There are different learning styles mentioned in the literature including sensory preferences, such as the Dunn and Dunn learning model (Dunn, 1990), or those associated with personality characteristics like those identified with the Myers Briggs Type Indicator (Jie & Xiaoqing, 2006; Myers, 1962).

One of the challenges with assessing learning assistance outcomes is gathering data that is both objective and relevant. This is due in part to the presence of many possible confounding variables. Additionally, the modes of learning assistance, such as one on one tutoring, do not naturally fit the constraints of experimental research such as the inclusion of a control group or random selection. Finding ways to measure physiological and psychophysiological data may help to strengthen educational research by the addition of some rigors associated with scientific inquiry. Pulse rate is one measure of psychophysiological arousal, such as stress (Youngmee, 2006). D. Rowland, A. Kaarianinen, & E. Houtsmuller (2000) demonstrated a connection between psychological response to a stimulus and physiological arousal in a learning activity. However, no research revealed in a literature search extended psychophysiological measures to learning styles. Therefore, this research helps fill a gap in the literature by demonstrating a preliminary connection between psychophysiological data, as a measure of a student's learning comfort, and information presented in accordance with different sensory learning preferences.

### **Background**

The sensory model of learning styles is the model that can be most closely matched with stimulus processing in the brain. Because this empirical study sought to gather psychophysiological data, this model was the most appropriate to use for assessing students' learning styles. This model posits that there are four major forms of modality of learning styles: visual, auditory, kinesthetic, and tactile (DiCarlo & Lujan, 2006).

Students with a visual preference learn best through a picto-



rial form or via other visual information. Students with an auditory style favor auditory stimuli, such as through lectures or discussions. Students with a tactile style prefer to learn through interaction with textual materials where they can hold the pencil or touch the paper handout, for example. Students with a kinesthetic preference learn better through performing or doing activities that promote physical involvement and manipulation of objects (DiCarlo & Lujan, 2006). Thus, the model of learning style that focuses on sensory preference suggests that signals between sense organs and information processing in the brain are modulated by individual preferences for one type of information over another.

Findings in cognitive psychology have suggested that pulse rate increases when the student reads a sentence that he or she does not recognize or understand, and pulse rate decreases when the student reads a sentence that he or she comprehends (Beyda & Spence, 1980). Consistent with the literature on stress and heart rate, a decrease in heart rate could suggest less stress or anxiety and, therefore, higher levels of comfort with learning such as obtaining information via the preferred sensory pathway. Thus, measuring pulse rate change provides a measure of student comfort with material.

## **Method**

### **Participants**

The participants ( $N=25$ ) consisted of adult coed students taking BI 101 and CH 101, introductory level biology and chemistry courses. Students in all sections of these classes were invited to participate in the study group. After attending an information session about the research, students who agreed to participate in the research signed documents indicating their informed consent.

### **Measures**

This study utilized three measures, the Barsch (1980) Learning Style Inventory (LSI), students' pulse rate, and a self-disclosing Likert-type survey. The Barsch LSI was developed to indicate students' preferences towards visual, sensory, tactile, or kinesthetic learning styles. The students received training in manually measuring their pulse rates and applied this training two times during each session to obtain an initial and final pulse rate. A self-disclosing Likert-type survey was completed at the last study session to assess students'

perceptions of study group outcomes. The surveys were approved for use by faculty and an administrator.

### **Procedure**

The Barsch (1980) Learning Style Inventory was administered to all students in the study groups, and the dominant learning style was then analyzed for each student according to the inventory key. Students were informed of their learning style preference, but they were not told what learning style was the primary mode of delivery for each study session. The students attended a one-hour study session for their course once a week for four weeks. The BI 101 and CH 101 study groups met separately because the content for each session was specific to each course.

Each session included three elements: it was conducted by an experienced peer tutor, certified College Reading and Learning Association, it contained a specific learning activity delivered primarily through one sensory mode, and it included two pulse rate measurements. Each student took his or her initial resting pulse rate five minutes into the study session to allow for the students to pulse rates to recover from normal activity involved in getting to the session. Each student also took his or her final pulse rate, according to directions from the peer tutor, at the halfway point of the one-hour session, after the student engaged in the learning activity. Study sessions were held once a week for each course. The content for each session was based upon what the students were learning in their classes during a given week. The sensory mode featured at a given session was randomly alternated for each course. The same peer tutor led every session.

**Week 1.** The BI 101 study group featured visual delivery while the CH 101 study group relied on tactile information. In the BI 101 study group, the tutor used pictures, chalk diagrams, and computer animation to visually explain and clarify the structure of the cell and its organelles. In the CH 101 study group, students used paper, pencils, and textual materials in the form of worksheets, crossword puzzles, and practice problems of the topics being covered in class. These topics were solving stoichiometry problems, balancing chemical equations, and calculating molarity.

**Week 2.** The BI 101 study group focused on the kinesthetic

mode of learning. The tutor instructed one student to hold a basketball at different heights while the other students jumped to reach it to demonstrate the role of activation energy in chemical reactions. To demonstrate differences between anabolic and catabolic reactions, the tutor instructed the students to link arms to represent building up a larger unit from smaller parts and then release one another to indicate being split into smaller parts. Thus, the students got to act out their understandings of the biological processes being studied.

The CH 101 study group used the auditory mode of learning. The tutor provided a mini-lecture and asked the students to talk with each other about what they understood from the lecture. The students also verbally explained to one another how they would approach each question the tutor asked them in order to achieve the correct answer.

**Week 3.** The BI 101 study group emphasized tactile information in the form of worksheets, crossword puzzles, and practice problems about photosynthesis and cellular respiration. The CH 101 study group learned about Hess's Law and the fundamental concepts of calorimetry through visual information, pictures and equations written on the board. The students demonstrated learning by identifying the pictures that were conceptually correct and which problems were correctly solved.

**Week 4.** The BI 101 study group engaged in auditory learning by receiving a mini-lecture from the tutor on the cell cycle. The tutor explained the stages of cell division and, after the students discussed the topic with one another, orally quizzed the students to test their knowledge of the material covered in the session. The CH 101 study group featured kinesthetic information. The tutor used inflated balloons to represent atomic orbitals. The students manipulated the balloons to learn about the shape and layout of atomic orbitals. The tutor provided a kinesthetic learning activity for Hund's Rule by placing paper on the floor to represent atomic orbitals. Each student, representing one electron, took his or her place on a piece of paper until each piece of paper had one student standing on it. The remaining students were then paired with the students already standing on the paper. The action involved in this activity represented electrons spreading out in orbitals until all orbitals had one electron before

electrons formed pairs in orbitals.

At the last session, students completed the self-disclosing, Likert-type survey to assess their perceptions of the study sessions. Students responded to the following items using one (strongly disagree) to five (strongly agree) rating: a) material presented in an understandable way, b) tutor explained concepts clearly, c) in session activities and materials were helpful, d) recommend study group to others, and e) study group increased performance in class assignments and tests.

### **Results**

The data was examined from the following perspectives: composition of study groups according to learning style preference and pulse rates, pulse rate changes when students' preferred learning style matched or did not match a session's delivery style, and pulse rate changes and self-disclosure data to identify whether student comfort was increased through participating in the study sessions as a whole.

The results of the Barsch (1980) inventory showed that 34% of the students in the biology study group had a dominant visual learning style, 22% of the students in that group preferred kinesthetic learning, 22% of the class preferred a bimodal learning style (two styles close together in preference) of visual and kinesthetic, 11% of the students preferred the auditory style, and 11% of the students favored tactile learning. Visual learning was also the dominant mode in the chemistry study group with 44% of the class scoring highest on this style of learning. Auditory was the second most preferred style, 25%, followed by kinesthetic, 19%, tactile, 6%, and bimodal visual and kinesthetic.

In addition to describing the groups in terms of sensory learning styles, the mean final pulse rates for two of the study sessions were calculated and compared to normal pulse rate ranges for healthy adults, determined to be between 60 and 100 beats per minute (Klabunde, 2007). The distribution of final pulse rate for all students was roughly symmetrical and was consistent with the normal adult range (see Figure 1).

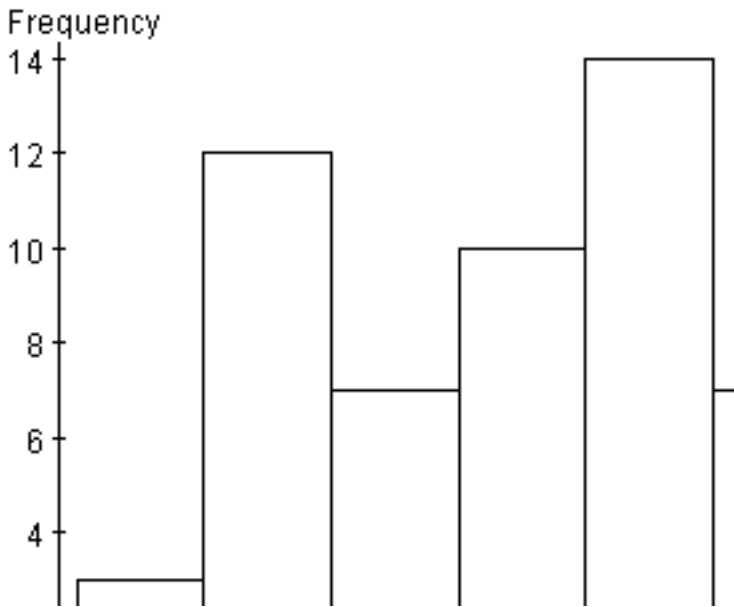


Figure 1. Combined distribution of participants' mean pulse measured at two study sessions.

Establishing that the students' pulse rates were close to the normal range was important for controlling for some pulse rate abnormalities that might impact how well the results could be generalized to a larger population.

To determine whether there was a statistically significant decrease in pulse rate when instructional style matched dominant learning style, a paired-sample t-test was conducted. The results showed that the students in the BI 101 group whose learning style matched the style presented in the study session had a significantly lower pulse rate than the students whose learning style was not matched in a given session. The same analysis of the CH 101 did not detect a significant difference in pulse rate when the students' learning styles matched the instructional styles of focus (See Table 1).

**Table 1****Comparison of Mean Pulse Rate Changes**

Learning Style and Instructional Delivery	Biology	Chemistry
Matched vs. Not matched	HA: $\mu_1 - \mu_2 > 0$	HA: $\mu_1 - \mu_2 > 0$
Mean Pulse Rate	12.64	5.00
Difference		
Standard Error	5.14	6.96
<i>t</i> statistic	2.46	0.71
<i>p</i> -value	0.0108	0.2412

*Note.* Based on information retrieved using StatCrunch 4.0. HA refers to alternative hypothesis;  $\mu_1$  refers to mean of unmatched;  $\mu_2$  refers to mean of matched. The null hypothesis:  $H_0: \mu_1 - \mu_2 = 0$ .

The mean pulse rate of the biology study group members whose learning style matched instructional style of focus was lower than the mean pulse rate of students whose learning style was not matched during the session. In contrast, results from the chemistry study group did not show a statistically significant difference between matched and unmatched pairings of learning style and instructional style of focus. However, data from both study groups showed that without considering learning style and delivery style final pulse rates were lower than initial pulse rates. The mean difference was 9.41 beats per minute with a standard error of 2.41. The *t*-statistic was 3.91 and the *p* value was less than 0.0001. This supported the notion that participating in peer-led study groups led to decreased physiological arousal, consistent with higher levels of learning comfort.

The statistical analysis suggested that for the biology students the visual and kinesthetic delivery styles were most effective because the average final pulse rate was significantly lower than the average initial pulse rate ( $p < 0.02$ ). For the chemistry students, the most effective learning styles were the tactile and auditory modes were effective because their average final pulse rate was significantly less than their initial pulse rate ( $p < 0.05$ ).

In addition to the physiological data, the students' responses to

the evaluation showed that students perceived the study sessions to be helpful (See Table 2). Possible responses were: 1 (strongly disagree), 2 (disagree), 3 (neutral), 4 (agree), and 5 (strongly agree). All response means for each question in the evaluation instrument were 4.66 or higher. For the items: material presented in an understandable way, session activities and materials were helpful, and recommend study groups to other students, all students' responses were strongly agree.

**Table 2**  
**Study Group Evaluation Summary**

Item	BI 101 Mean	SD	CH 101 Mean	SD
1. Material presented in an understandable way.	5	None	5	None
2. Tutor explained concepts clearly.	4.83	.44	5	None
3. Session activities and materials were helpful.	5	None	5	None
4. Recommended study to others.	5	None	5	None
5. Study group increased performance in class assignments and tests.	4.66	.44	4.66	.44

*Note.* Microsoft Excel 2003 used to analyze data.

### Discussion

The most promising implications of the results from this empirical study are two-fold. First, physiological data along with self-disclosure surveys support the efficacy of peer-led study groups as a way to increase student comfort and enhance learning. Second,

psychophysiological data may allow researchers and practitioners to better customize learning assistance strategies, such as delivering material in a way that takes into account the students' learning styles in some cases. The data from the study groups affirmed the theories applied and matched with survey responses such as study groups being helpful and material being presented in an understandable way. Results from the self-disclosure survey clearly indicated that students found the study sessions beneficial, believed the study groups had boosted their academic performance, and would recommend the sessions to others. Lower heart rates were consistent with higher comfort through each session.

Results of the study provide initial support for the effectiveness of peer-led study sessions in decreasing stress and, therefore, increasing comfort associated with learning. Final pulse rates were significantly lower than initial pulse rates for both biology and chemistry study groups. Additionally, the biology study group members' results indicated an increased comfort when material was presented in a format consistent with their dominant learning style as opposed to their non-dominant learning style. The chemistry study group did not show statistical evidence of increased comfort when learning style and instructional style were matched. This difference in the biology and chemistry study groups upholds the value of providing learning assistance techniques that match the students' major learning style in some settings. The findings simultaneously raise questions for future research to consider regarding when (and why) matching delivery and learning style matters.

### Implications

In addition to the aforementioned research avenue, there are several other crucial praxis implications of the findings:

- Learning comfort may play an important role in student retention. B. Linn & R. Zeppa (1984) and C. Struthers, R. Perry, & B. Menec (2000) noted a relationship between academic performance and stress students' experienced during studying. Therefore, learning assistance techniques such as the study groups used in this research and incorporating delivery methods that reached different learning styles in some settings could help mitigate student stress and in-



crease student retention.

- Empirical support of the use of tutor-led study groups strengthens the field of learning assistance and is useful for learning center personnel who need to provide their administrators with outcomes-based evidence.
- Because students' vary according to the type of sensory information they prefer, it is important for tutors to be adept at practical and creative ways to meet students' learning needs.
- There appears to be certain classes or course areas where presenting information in multiple sensory modes is more efficient. This is indicated by the differences in the biology and chemistry study groups with regard to matching learning and delivery style. This study highlights the need for additional understanding of the differences between the role of learning styles and learning comfort in the two science courses featured in the study sessions. With this knowledge, learning center administrators could better use their resources and train tutors on the appropriateness of incorporating and applying learning style knowledge

### **Further Study**

Running the study groups again along with a physics study group and an organic chemistry study might provide some insight as to whether a difference in the results could be explained by whether the course is more heavily math-based (e. g., physics or chemistry) or conceptually based (e. g., biology and organic chemistry). Future research might also benefit from overcoming the limitations of this study such as by utilizing a larger sample size, multi-institution sample, and proportionate random sample. Additional research regarding possible confounding variables such as age, gender, ethnicity, familiarity with the subject (e. g., having had college level courses previously), or degree of science anxiety might help clarify the results more fully. A pre-test and post-test design might allow researchers to track the impact of the study sessions while accounting for baseline levels of scientific knowledge. Future research might also benefit from more regulated experimental conditions or more sophisticated physiological measures, such as measuring blood pressure, or monitoring pulse

rate continuously. However, the challenge with implementing these suggestions is that doing so may take away from the efficiency of the students' experiences or take the focus from providing learning assistance services.

Other suggestions for future study might be using a different learning style instrument and comparing the results using the Barsch (1980) questionnaire with other learning style models. The research could also benefit from a stronger qualitative component or more extensive survey questions to determine what helps foster the comfort and to learn more fully how students perceive the learning assistance they receive. An obvious example might be including an anxiety scale to assess students' perceptions of anxiety before, during, and after the study group sessions. Longitudinal research could examine whether the findings are part of a larger trend.

### **Conclusion**

This study provided support for the role of psychophysiological data in determining the efficacy of learning assistance methods and the application of learning style theories. The results indicated that students who participated in the study groups had significantly decreased pulse rates, pointing to enhanced learning comfort. Increased comfort has been associated with better academic performance and retention. Thus, the research upheld the value of learning assistance techniques in academic achievement and retention. The results also suggested that matching information delivery and learning style aided student comfort in some cases, such as those in the biology study group, although explaining and predicting these differences will need to be shown through additional research and practice. Understanding students' preferred learning styles, as well as a when matching instruction to learning preferences matters most, can help educators make decisions about customizing the lesson to the students' individual preferences (DiCarlo & Lujan, 2006).

### **References**

- Barsch, J. (1980). Barsch Learning Style Inventory. University of Central Florida. Retrieved February 13, 2007 from [www.sarc.sdes.ucf.edu/ss78.pdf](http://www.sarc.sdes.ucf.edu/ss78.pdf).

- Beyda, R. D., & Spence, P. D. (1980). Heart-rate changes as measure of verbal storage and retrieval. *British Journal of Psychology*, *71*, 283-293.
- Davis, S. M., & Franklin, S. V. (2005). Assessing the impact of student learning style preferences. *AIP Conference Proceedings*, *720*(1), 53-56. Retrieved September 11, 2007 from Academic Search Premier database.
- DiCarlo, E. S., & Lujan, L. H. (2006). First-year medical students prefer multiple learning styles. *Advanced Physiological Education*, *30*, 13-16.
- Dunn, R. (1984). Learning style: State of the science. *Theory into Practice*, *23*(1), 10-19 Retrieved September 11, 2007 from JSTOR database.
- Dunn, R. (1990). Understanding the Dunn and Dunn Learning Styles Model and the need for individual diagnosis and prescription. *Reading & Writing Quarterly*, *6*(3), 1057-3569. Retrieved September 11, 2007 from <http://www.informaworld.com/10.1080/0748763900060303>
- Jie, L., & Xiaoqing, Q. (2006). Language learning styles and learning strategies of tertiary-level English learners in China. *RELJ Journal*, *37*(1), 67-90. Retrieved September 11, 2007 from Academic Search Premier database.
- Johnson, J. A. (2006). Beyond the learning paradigm: Customizing learning in American higher education: 10 bellwether principles for transforming American higher education. *Community College Journal of Research & Practice*, *30*(2), 97-116.
- Johnson, C., & Orwig, C. (1998). Your learning style and language learning. *SIL International*. Retrieved May 8, 2007 from <http://www.sil.org/lingualinks/languagelearning/otherresources/YorLrnnngStylAndLnggLrnnng/contents.htm>

- Klabunde, R. E. (2007). Normal heart rhythm. *Cardiovascular physiology concepts*. Retrieved December, 15 2007 from <http://www.cvphysiology.com/Arrhythmias/A002.htm>
- Linn, B. S., & Zeppa, R. (1984) Stress in junior medical students: relationship to personality and performance, *Journal of Medical Education*, 59, 7–12.
- Myers, I. B. (1962). *The Myers-Briggs type indicator manual*. Princeton, N. J.: Educational testing service.
- Rowland, D. L., Kaarianinen, A., & Houtsmuller, E. J. (2000). Interactions between physiological and affective arousal: A laboratory exercise for psychology. *Teaching of psychology*. 27(1), 34-37.
- Struthers, C. W., Perry, R. P. & Menec, V. H. (2000). An examination of the relationship among academic stress, coping, motivation and performance in college, *Research in Higher Education*, 41(5), 581–592.
- Youngmee, K. (2006). Gender, attachment, and relationship duration on cardiovascular reactivity to stress in a laboratory study of dating couples. *Personal Relationships*, 13(1), 103-114.

## Pertinent Publishing Parameters

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The Learning Assistance Review (TLAR), the national peer reviewed official publication of the National College Learning Center Association (NCLCA), publishes scholarly articles and reviews that address issues of interest to learning center professionals (including administrators, teaching staff, faculty, and tutors) who are interested in improving the learning skills of postsecondary students. Primary consideration will be given to articles about program design and evaluation, classroom-based research, the application of theory and research to practice, innovative teaching and tutoring strategies, student assessment, and other topics that bridge gaps within our diverse profession.

### Categories for Submission

#### Articles

- Topics: TLAR will accept manuscripts that address our purpose: to publish scholarly articles and reviews that address issues on program design and evaluation, classroom based research, the application of theory and research to practice, innovative teaching and tutoring strategies, student assessment, etc.
- Types: TLAR will accept manuscripts following all four of the article types outlined in the American Psychological Association Manual: empirical study and articles on review, theory, and methodology. Follow APA manual (chapter 1.4) for specific requirements and structure for each type; regardless, all manuscripts need a clear focus that draws a correlation between the study, review, theory, or methodology and learning assistance practices.

## **Joining the Conversation**

- **Idea Exchange:** Discussion directly relates to articles published in TLAR. Submissions are limited to fewer than four paragraphs and are to be constructive idea exchanges. In addition to the name, title, college, and contact information from the submitter, Idea Exchange submissions are to include the details of the referenced article (Title, author, and volume/number, and academic semester/year). A submission form may be found online on the TLAR website.
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## **Book Review**

Book review requests should be accompanied with two copies of the book to facilitate the reviewing process. Potential book reviewers are urged to contact the editorial team for details.

## **Manuscript Guidelines**

Manuscripts and reference style must be in accordance with the Publication Manual of the American Psychological Association (5th ed.) through January 2010. Submissions that do not comply with APA style will be returned to the author(s). Manuscripts must be original work and not duplicate previously published works or articles under consideration for publication elsewhere. The body of the manuscript may range in length from 10 to 15 pages, including all references, tables, and figures. Longer articles will be considered if the content warrants it. The authors are responsible for the accuracy of all citations and references and obtaining copyright permissions as needed. The only acknowledgments that will be published will be those required by external funding sources.

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- The lead author should provide work and home addresses, telephone numbers, fax, and e-mail information where applicable.
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- a masked manuscript for review.
- abstract of the manuscript, maximum 100 words.
- figures and tables must be black and white, camera ready, according to APA style.
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## NCLCA Membership Information

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### **What is NCLCA?**

The National College Learning Center Association (NCLCA) is an organization of professionals dedicated to promoting excellence among learning center personnel. The organization began in 1985 as the Midwest College Learning Center Association (MCLCA) and “went national” in 1999, changing the name to the National College Learning Center Association (NCLCA), to better represent its nationwide and Canadian membership. NCLCA welcomes any individual interested in assisting college and university students along the road to academic success.

NCLCA defines a learning center as a place where students can be taught to become more efficient and effective learners. Learning Center services may include tutoring, mentoring, Supplemental Instruction, academic and skill-building labs, computer-aided instruction, success seminars and programs, advising, and more.

### **Join NCLCA**

NCLCA seeks to involve as many learning center professionals as possible in achieving its objectives and meeting our mutual needs. Therefore, the NCLCA Executive Board invites you to become a member of the Association.

The membership year extends from October 1 through September 30. The annual dues are \$50.00. We look forward to having you as an active member of our growing organization.

### **Membership Benefits**

- A subscription to NCLCA’s journal, *The Learning Assistance Review*
- Discounted registration for the Fall Conference and for the Summer Institute
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- Voting privileges
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## Membership Application

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Contact the Membership Secretary to request an invoice if needed.

OR

Complete an application and send it with your dues payment to the NCLCA Membership Secretary. Be sure to check whether you are a new member or are renewing your membership. If you are renewing your membership, please provide updated information.

Please direct all questions regarding membership to the contact below:

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