DOCUMENT RESUME

ED 394 413 HE 029 107

| | |
|---|---|
| AUTHOR | Higbee, Jeanne L., Ed.; Dwinell, Patricia L., Ed. |
| TITLE | Fountains of Opportunity. National Association for Developmental Education Annual Conference Proceedings (18th, Kansas City, Missouri, March 2-6, 1994). |
| INSTITUTION | National Association for Developmental Education. |
| PUB DATE | Mar 94 |
| NOTE | 50p.; For the 1993 Proceedings, see ED 369 323. |
| PUB TYPE | Collected Works - Conference Proceedings (021) -- Reports - Descriptive (141) |
| EDRS PRICE | MF01/PC02 Plus Postage. |
| DESCRIPTORS | Compensatory Education; Cooperative Learning; *Developmental Programs; Disabilities; Higher Education; High Risk Students; Humor; *Learning Strategies; Mathematics Instruction; Multicultural Education; Multimedia Instruction; Reading Instruction; *Remedial Instruction; *Remedial Programs; Special Needs Students; Teacher Student Relationship; Videotape Recordings; Writing Instruction |

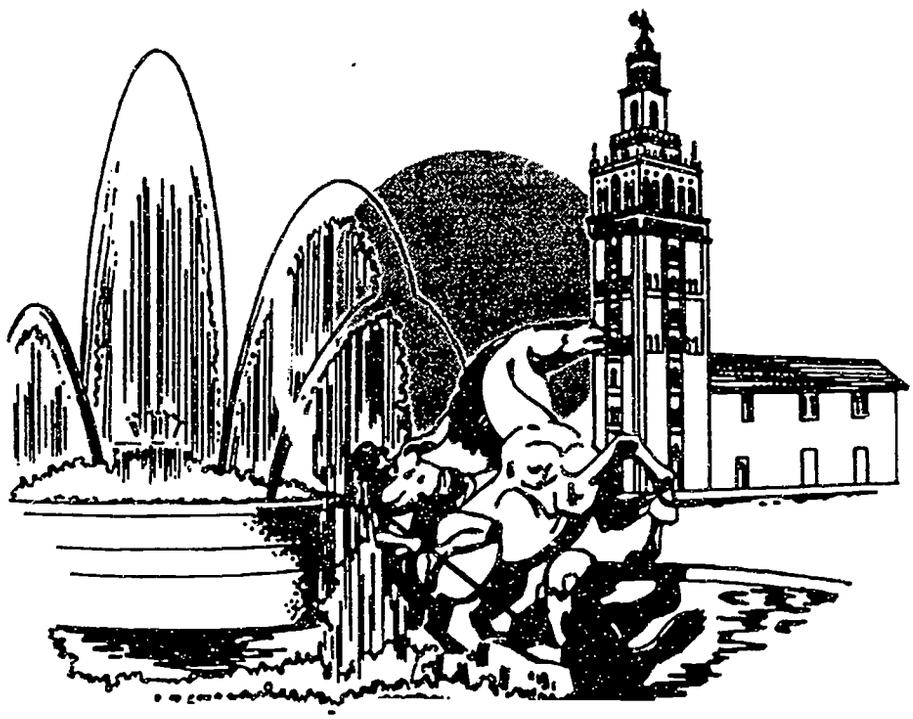
ABSTRACT

This proceedings publication addresses issues in developmental education at the postsecondary level. Papers are: "Public Relations: Making Videos to Promote Your Program" (Carol H. Bader and Kathy Liles); "Winning Strategies Through Individualized Learning in the Success Center" (Deanna L. Culbertson and Phillip C. Johnson); "Implementing Holistic Approaches in the Community College Reading Center" (Andra L. Dorlac); "Instructional Strategies to Promote Motivation of Developmental College Students" (Margaret Drew); "Integrating Teacher/Student Learning Preferences With Effective Note-Taking" (Dorothy H. Fancher); "A Teaching Excellence Program for Developmental Education" (Christine Hall et al.); "Your Teaching Experiences and Students With Disabilities" (Bonnie MacLean Hodge and Jennie Preston-Sabin); "Transition to College: Leveling the Playing Field" (Marjorie L. Illingsworth and Ronald D. Illingsworth); "Effective Writing Conferences: Teaching and Learning, One to One" (Margaret Kantz et al.); "Opportunity for Developmental Faculty: Videotape Project on Collaborative Learning" (Cathy W. Leist et al.); "Beyond the 3 Rs: Fostering Student Responsibility" (Patricia McClure and Barbara Henry); "Developing Visualization and Spatial Skills" (Jan Melancon); "MBTI Learning Style Preferences and Mathematics Instruction Methods" (Dorothy C. Newman and Charlotte Matthews); "Humor in the Mathematics Classroom? But Seriously" (Chuck Nicewonder); "Establishing a Training Program for Learning Assistants" (Gary M. Parilis and Bob Nelson); "Adult Literacy Models: Incorporating Creative and Critical Thinking Development" (Emily Miller Payne and Barbara G. Lyman); "On Seeing Black Through Both Blue and Brown Eyes" (Patricia T. Price et al.); "The Role of Institutional Support in Developmental Student Retention" (Ruth Salter and Ann Gray Noblett); "Producing and Utilizing Multicultural Videos in Developmental Writing" (Jaime Sanchez and Annette Sanchez); and "Successful Experiences and Outcomes of Cooperative Learning" (Donna Saye and Tammy Abbott). (Individual papers contain references.) (NAV)

ED 394 413

# Proceedings of the 18th Annual Conference of the National Association for Developmental Education

NADE '94





*"Fountains of Opportunity"*

March 2-6, 1994
Kansas City, Missouri

# Proceedings of the 18th Annual Conference of the National Association for Developmental Education

Kansas City, Missouri
March 2-6, 1994

Editors:
Jeanne L. Higbee and Patricia L. Dwinell
The University of Georgia

# Editorial Board



Special thanks to Betty Davis and Thomas Coullard
for their clerical and technical support.

# Table of Contents

# Public Relations: Making Videos to Promote Your Program

*Carol H. Bader*
*Kathy Liles*
*Middle Tennessee State University*

## Abstract

*The objective of this project was to promote positive public relations through creation of departmental videos that could be shared with legislators, high schools, civic organizations, and campus personnel. The demonstration consisted of four parts: (a) showing the video of the program that won the 1992 John Champaigne Award; (b) discussing procedures for making a good video; (c) sharing ways to promote developmental programs with various groups; and (d) disbursing data sources.*

Despite the research on the successes of developmental students and the positive data concerning their retention and graduation, it is still necessary to "sell" developmental programs to students, parents, legislators, even other faculty on campus. Some of the information that should be communicated to others includes Southern Regional Education Board data that indicate that 82% of all higher education institutions and 94% of public institutions offer at least one course considered to be remedial or developmental (Abraham, 1988).

Carlette Hardin (1988) has provided some useful material to share with others. She asserts there are five assumptions based on current research that affect developmental studies in postsecondary institutions.

1. Developmental students are underprepared. This underpreparedness does not equate with incapable or ineducable.
2. The reasons for underpreparedness are complex and often are out of the control of the developmental student.
3. Developmental students can overcome their deficiencies when placed in appropriate remedial and/or developmental courses.
4. Developmental students can overcome their deficiencies when given the opportunity and time to learn.
5. Assistance in social and personal development is often as critical to the success of developmental students as academic interventions (p.2).

Most developmental studies programs are making wonderful strides with underprepared students. At this university, students who begin in the developmental studies program are being retained at a higher rate than non-developmental students in freshman to sophomore retention studies. They comprise over 35% of graduating seniors and 4% of students who receive graduate degrees. Nine percent of former developmental students graduate with honors.

However, it is still necessary to let others know about the program and about its successes. One effective way of acquainting people with the facts and data noted above was to create a video to promote the developmental studies program. The impact of a video is immense since it utilizes many of the senses. Sensory encoding is one of the more successful ways information can be conveyed and retained.

There are four steps to produce a video about an academic department or program. First, check to see if professional assistance is available. Many places may be able to help: radio and television services, public relations, mass communications, the library, and the academic program or department itself. Get initial clearance from the department; then check with the other sources to see what they can and will do to help. Most faculty members are not professional movie makers; suggestions and expertise from qualified professionals are important.

Second, select a theme. This theme is critical to the message the video conveys. For example, the theme may be informational or promotional. At this point, critical decisions must be made. State what the video is meant to accomplish, the intended audience, the length and cost of the project, and the timeline for

completion. The purpose of this video was to educate high schools, civic organizations, college faculty, incoming freshmen, and legislators about an award winning developmental studies program. The video runs for five minutes and costs just the price of the cassette.

The third important step is the development of the script, which is in two parts: audio and video. The audio portion includes the scene's introduction, a brief description, and dialogue. The music must be in the public domain—that is, it is no longer under any kind of legal restraint. The selection of the intended audience in the previous step comes into play here; the dialogue, music and presentation of information must be appropriate for the audience. Next, the video selection includes the who, what, when and where. The actors and camera persons need a schedule of the dates, times, and places for shooting the scenes. A sample of a shooting schedule is provided in Figure 1.

The fourth and final step is script selection. Decide on the most important reasons the video is being created. Selection of information should be based on validity, credibility, and creativity. For example, the video produced for this program has eight major premises. The video was designed to convey the positive leadership in the department with a guest shot and testimony from the chairperson. Second, the video included statements of support from the university administration. Next, shots of faculty and staff revealed the department's competency. The counseling component is crucial to the Developmental Studies Department, so counseling sessions were filmed. Further, the reading, writing, and math labs were filmed to illustrate support systems for students. Several exemplary students gave testimonies of the effectiveness of the program. A wide diversity of students was reflected in the video as well as a wide diversity of innovative instructional techniques used by the faculty. Since the campus is the most physically challenged accessible in the state, access to special support for students with disabilities was filmed. The seventh element reflects the small class size. Finally, the video points to former developmental students' high pass rate in college courses.

This video was shot entirely on the BetaCam format. This broadcast quality format was chosen for ease in editing. The editing was done on a Sony A/B roll system. All character generation and special effects were done on the New/Tek Video Toaster.

Although making a department video requires much work and planning, it does not require formal training in photography or script writing to be successful. If all parties contribute and follow a well-organized time line, a video project for an academic program or department should take about three months. The rewards and results are challenging and beneficial to all involved in the production and for those who view the video. For a copy of the Developmental Studies Video, please contact one of the authors.

## References

*Abraham, A. (1988). Remedial education in college: How widespread is it? Atlanta, GA: Southern Regional Education Board*

*Hardin, C. (1988). Access to higher education: Who belongs? Journal of Developmental Education, 12(1), 2-4, 6, 19*

### Figure 1. Sample Shooting Schedule

DEVELOPMENTAL STUDIES VIDEO
SCHEDULE FOR 5/20/93

TIME
10:00 - 11:00
PLACE
Cope administration Building
ACTIVITY
1) President Walker at his desk
2) State Representative Liles with Department Chairperson receiving award
3) State Representative Liles at desk with flag in background

TIME
11:00 - 12:00
PLACE
Peck Hall
ACTIVITY
1) Secretaries at work
2) Disabled student coming down wheelchair ramp

PLACE
Library
3) Older developmental studies couple walking down steps

PLACE
Stark Agricultural Building
4) Honor student in nursing setting

# Winning Strategies through Individualized Learning in the Success Center

*Deanna L. Culbertson*
*Phillip C. Johnson*
*Douglas MacArthur State Technical College*

## Abstract

*At Douglas MacArthur State Technical College, a learning lab, the Success Center, has been established to meet the needs of developmental students in reading, writing, and mathematics. Various instructional methods are used in the Success Center, including computer software and traditional instruction. This method has also been borrowed by MacArthur's industry partner, Shaw Industries Plant 65, in establishing an on-site learning lab. Using the same instructional methods and materials, both labs have been highly successful in meeting the basic skills needs of students, both on the college campus and in the workplace.*

Developmental education demands that a variety of instructional methods be used. This approach is the basis for the curriculum utilized in the computerized learning laboratory, the Success Center, on the college's campus and in a similar lab at an industry that serves as the college's partner in workplace literacy.

The Success Center, funded by a Title III grant to serve developmental students by offering as wide a variety of instructional methods as possible, has proven to be successful in enhancing the educational opportunities for the developmental student. Many of these students are high school drop-outs for whom the word "education" has a negative connotation, so it is extremely important to offer them more than the traditional "lecture" class.

The first step in creating this successful developmental program was the requirement of a placement test, the ACT Asset (American College Testing Program, 1989), followed by mandatory placement in developmental studies as needed. Once placed in developmental studies, a student has access to computerized instruction through Skills Bank II Network software (E & E Enterprises, 1991) and self-paced instruction through PACE Learning Systems' Individually Prescribed Instructional System (IPIS; 1988), which is correlated to the Test of Adult Basic Education (TABE; CTB/McGraw-Hill, 1987). This combination of computerized and print instruction has proven vital in meeting the needs of the developmental student. According to a survey conducted during a state youth project during the summer of 1990, the conjunctive use of these two programs is more effective in enhancing basic skills among students than either one separately or in combination with other programs.

In the Success Center, developmental students are offered Basic Writing (which includes instruction in grammar, language, writing, reading, vocabulary, and spelling) and Basic Math. Both classes utilize Skills Bank software two days a week and the PACE materials three days a week. Although both programs are individualized and self-paced, an instructor is always available; this teacher is vital to the effectiveness of these two programs.

In Basic Writing, students read News For You, a weekly newspaper published by New Readers Press. This inexpensive paper enhances the reading and comprehension skills of the students. Each week, a worksheet, Focus (New Readers Press), in which students must answer questions from the articles they

have read in the paper, is included. Also, the paper often gives opportunities for the students to write various essays and have them published in a future edition of the paper. Many students on our campus have had their works published, giving them more self-confidence than any other accomplishment in their educational experience.

Other tools used in the Basic Writing classes are electronic dictionaries and speaking/spelling devices. These devices, along with the Skills Bank software on the computer, teach students to use modern technology, an extremely important skill in today's changing workplace, while they are learning basic skills.

After recently receiving a Student Support Services grant, the college has been able to further enhance its successful developmental program. Through this grant, the institution can now offer peer tutoring, study skills classes, and cultural events to developmental students. The range of students that can be served in Basic Writing has been increased by purchasing the Reading Competency Cabinet (1992) and the Individualized Reading Instructional System (IRIS; 3rd ed., 1989) from PACE. This IRIS system accommodates the student whose reading level is at second grade or below. In Basic Math, IPIS (1988) and the Math Competency Cabinet (1994) from PACE are used, and through the use of the Applied Skills Cabinet (ASC; 1988) from PACE, the institution now offers more job-specific applications in the study of basic computation.

After only three years in the developmental education business, the college has seen vast improvement, by post-testing these students with another form of the ACT Asset, in the preparedness of students for higher level general studies courses and in their major fields. It is likely that this success is due to the organization of and instructional methods used in the college's Success Center.

## Taking It to the Industry

Workforce 2000 Partnership, the college's workplace literacy project, has the same goals as the college's developmental education program—to assist adults in learning basic developmental skills to make them more productive members of society. The only difference is that Workforce 2000 Partnership seeks to achieve these goals with industry personnel.

The college's Success Center, in addition to being used for organized classes and workshops, has been open to industry personnel on a come-as-you-can basis. Industry employees have been able to upgrade basic skills using Skills Bank software, utilize industry specific learning modules, prepare for the General Education Development (GED) test using the GED 2000 software (Steck-Vaughn, 1990), and participate in organized classes and seminars such as pre-textile math, workplace writing, interpersonal communications, and workplace measurement skills.

One of the college's industrial partners in the project established a Success Center inside its plant with computers and software very similar to those in the college's Success Center to serve as the focal point for education at the plant. When the concept of an in-plant learning lab at the industry was first being discussed, the Human Resources Manager and Training Manager visited the college's Success Center and used it as a model for developing their own. The TABE, PACE, texts from various publishers, and Skills Bank software are used in various combinations, along with instructor-developed assessment and curriculum, to address the workplace literacy needs of plant employees.

The greatest area of need at the plant seemed to be among newly-hired employees. The applicant pool seemed to be composed of individuals who were older and needed a review of basic skills or members of "Generation X," who needed practical problem-solving, commitment, and adaptability training.

A "Success Skills for the Textile Industry" workshop was designed, that gives newly-hired employees the opportunity to participate in seminars devoted to adaptability and commitment, stress management, time management, team building, problem solving, communication, and basic skills. This workshop lasts for two weeks (eigl ty hours) and begins with a full day of orientation and assessment in which participants are introduced to the workshop and assessed using the TABE for reading and writing and an instructor-developed math test that specifically addresses needs identified by the job-audit panels.

The basic skills component of the workshop is conducted very much like the developmental strategy used in the college's Success Center. This strategy involves identifying participant needs with assessment, prescribing lessons involving both Skills Bank software and print materials, and assessing for progress. Participants work individually, at their own pace, with an instructor available to provide explanations and assistance. Basic skills instruction is conducted for four days, four hours per day, and six days for eight hours, for a total of 64 hours.

The employee development component features a facilitator who assesses participants' knowledge of seminar topics, guides participants through activities and discussion that foster growth and development; and then administers a post assessment to measure progress Seminars are conducted for four days, four hours each, for a total of sixteen hours.

The pro-active approach that the partner industry and the college have taken to address workplace literacy problems has been monitored by plant management, human resources, training, supervisory, and engineering personnel, as well as by college workplace literacy personnel. Results have shown that new employees are reacting positively to the workshop, and are better prepared for job training. Employee retention and efficiency have significantly improved since implementation of "Success Skills for the Textile Industry," demonstrating a positive impact of this approach to learning.

With few changes to meet the specific needs of industry, this varied instructional method, including technology and traditional "pen and paper" curriculum, has proven to be highly effective. These "winning strategies" are continuing to help students both on the college campus and those already employed, achieve confidence, independence, and success.

## References

*ACT Asset Test (1989). Iowa City, IA: American College Testing Program.*

*Applied Skills Cabinet (1st ed.) (1988). Tuscaloosa, AL: PACE Learning Systems, Inc.*

*Focus. Syracuse, NY: New Readers Press*

*GED 2000, Network version (1990). Austin, TX: Steck-Vaughn Company.*

*Individually Prescribed Instructional System (5th ed.) (1988). Tuscaloosa, AL: PACE Learning Systems, Inc.*

*Individualized Reading Instructional System, (3rd ed.) (1989) Tuscaloosa, AL: PACE Learning Systems, Inc*

*Math Competency Cabinet (2nd ed.) (1994) Tuscaloosa, AL: PACE Learning Systems, Inc*

*News For You. Syracuse, NY: New Readers Press*

*Reading Competency Cabinet (2nd ed.) (1992). Tuscaloosa, AL PACE Learning Systems, Inc.*

*Skills Bank II Network Program (Version 2.24) (1991). Auburn, AL: E & E Enterprises.*

*Test of Adult Basic Education (1987). Monterey, CA: CTB/McGraw Hill.*

# Implementing Holistic Approaches in the Community College Reading Center

*Andra L. Dorlac*
*Jefferson College*

## Abstract

*Although recent research shows holistic approaches more effective than skills-based approaches, holistic learning seems more compatible with traditional classroom settings than the lab setting of many developmental reading programs. However, Brian Cambourne's seven conditions of learning can serve as a framework to implement these approaches. He contends that immersion and demonstration, accompanied by engagement of the learner, are the key conditions, enhanced by the other five conditions. These can be adapted to the lab setting through building metacognitive awareness with learning logs and response journals, demonstrating reading strategies, integrating reading with writing and other subjects, and developing literature-based learning experiences.*

Community colleges have been responding to the needs of "at risk" students by providing developmental reading courses to help students approach college reading material more effectively. In general, skills-based approaches seem more compatible with the lab setting used for many of these courses, and holistic approaches seem more suited to the traditional classroom. However, with some adaptation, it is also possible to implement holistic approaches in the lab setting.

Brian Cambourne (1988) has identified seven conditions of learning that embody the whole language philosophy and can serve as a framework for implementing holistic approaches. These conditions include immersion and demonstration, which he feels must be accompanied by engagement of the learner. The other five conditions of expectation, responsibility, use, approximation, and response are seen as aids in increasing this probability. Ultimately, the learner must feel that what is being asked is "doable," that it "will further ... [his] purposes" and that it can be done "without fear ... or ... hurt." (p. 33) Using these conditions as a guide, several holistic approaches to learning were successfully adapted for the developmental reading courses in the lab setting of the community college learning center.

The learning log was the first strategy modified. To encourage students to write more and become more aware of their progress, the entry spaces on the sign-in sheet in the students' folders were enlarged to boxes. Verbal demonstrations, as well as written examples, were given to students to model what was expected. An instructor response column was also incorporated to provide feedback regarding student concerns and progress, as well as guidance toward closer approximations. The purpose of this was to assist students in becoming "increasingly responsible for judging the quality of their own work" to enable them "to take control of their own learning" (Tierney, Carter, & Desai, 1991, p 79).

The literature response journal notebook was adapted to the lab setting by stipulating two common novels for reading rather than having small literature study groups choose their own. A puzzle mystery was chosen for the first novel to encourage students to make predictions and give their reactions to the clues rather than just retelling the story. The second novel was a science fiction book related to reading and censorship. This learning experience was very doable, creating an "atmosphere which encourages learners to take risks and make guesses" (Keefe & Meyer, 1980, p. 123) A self-assessment checklist was also developed

to allow students to evaluate their own progress and take responsibility for their own learning.

Another adaptation involved the instructor providing a "think aloud" (Dillard, 1989).

> ...instructors serve as thinking models to their students by describing their own reading behavior...not only what they think and feel about the selection, but how they incorporate their own individual knowledge and experience into what is read... a description of the mind's sorting process (p. 112).

This could be used one on one in the lab to demonstrate the thought process that might take place as a student previews or clarifies misunderstandings that may arise in the reading process to "enable students to realize when their comprehension is breaking down and what to do about it" (Mealey & Nist, 1989, p. 485).

Holistic approaches could also involve integrating reading with writing and other subject areas. Since the institution's reading and writing instructors were located in the library building, an integrated reading/writing/library research activity was coordinated. An interest inventory was developed to aid in recommending a motivating topic for the student. Then a summary writing assignment was designed to help students see the parallel between summarizing (a writing skill) and getting the main idea (a reading skill). Through this experience, "writing about reading material turns the reading process inside out, exposing readers to the inescapable constructivist activity of creating meaning in and from words" (Stahl, Simpson, & Hayes, 1991, p. 2). Since students were required to locate a book, magazine article, and newspaper article on their topics, they became actively involved in learning how to use the library, which also served to immerse the students in a variety of text. Furthermore, the instructors became "facilitators of knowledge rather than distributors of information ... so that [t]he remedial approach is replaced by one of mediation" (Bartholomae & Petrosky, 1986, pp. 138-139). This resulted in the learning experience being more student-centered rather than teacher-centered, with the instructor acting as a coach or guide in the learning process.

Literature-based learning experiences are also holistic approaches that can be adapted to the lab setting. The instructors brainstormed to develop alternative learning experiences in conjunction with a novel being read. These activities ranged from writing a comparison of the book and the video to doing further research on an intriguing author or writing their own ending to the book. This gave the students choices and encouraged them to submit their own proposals to give them more ownership.

To effectively meet the needs of developmental reading students in community colleges in the future it will be necessary to apply recent research to the lab setting that exists in many of these programs. A wide network of reading center labs exists in community colleges. Through creative adaptation these labs can implement holistic approaches in order to better assist underprepared college students in meeting the demands of college reading.

## References


*Bartholomae, D., & Petrosky, A. (1986). Facts, artifacts, and counterfacts. Upper Montclair, N.J.: Boynton/Cook.*

*Cambourne, B. (1988). The whole story: Natural learning and the acquisition of literacy in the classroom. Ontario, Canada Scholastic-TAB.*

*Dillard, M. L. (1989). Modeling reading behavior in a college developmental reading program. Reading Improvement, 26, 110-114.*

*Keefe, D., & Meyer, V. (1980). Adult disabled readers: Their perceived models of the reading process. Adult Literacy and Basic Education, 120-124.*

*Mealey, D. L., & Nist, S. L. (1989). Post-secondary teacher-directed comprehension strategies. Journal of Reading, 32, 484-493.*

*Stahl, N. A., Simpson, M. L., & Hayes, C. G., (1991). How college learning specialists can help college students. (ERIC Document Reproduction Service No. ED 334 571)*

*Tierney, R. J., Carter, M. A., & Desai, L. A. (1991). Portfolio assessment in the reading-writing classroom. Norwood, MA: Christopher-Gordon.*

# Instructional Strategies to Promote Motivation of Developmental College Students

*Margaret Drew*
Southern Illinois University at Edwardsville

## Abstract

*Many college students are enrolling in developmental courses to gain support in the task of learning to learn. If education is to be effective for these adult developmental students, the instructor must use appropriate strategies to promote motivation.*

A series of focus interviews of college students enrolled in developmental classes resulted in suggestions for instructional strategies. These practical suggestions were compared to the implications of research performed by behaviorist, humanist, and cognitive theorists. To ensure greater student success and persistence, instructors should be aware of and apply these motivational techniques.

A growing number of entering college students experience difficulty fulfilling the many requirements of the college learning process. For many of these students, developmental classes offer instruction and support in the often difficult task of learning how to learn. Although most developmental students enter the learning situation voluntarily, many do not have a realistic perception of their learning skills, nor do they have a high degree of self-confidence in their ability to learn in the college environment.

Other factors that may prevent full participation in education include time constraints, cost, personal problems, and lack of perceived course relevance to everyday life (Valentine & Darkenwald, 1990). Therefore, focus interviews were conducted to ascertain particular instructional strategies that would motivate adult developmental students to succeed in coursework and persist in their college endeavors. The students' suggestions were then compared to the implications of research performed by proponents of the behaviorist, humanist, and cognitive theories

Students described motivation as focusing on one's reason for undertaking a task and cautioned that intrinsic motivation was the determining factor in involvement in the learning situation. The humanist, Abraham Maslow, proposed that humans are driven to satisfy basic physiological needs and only make wise choices when the need for self-actualization is achieved (Maslow, 1987). Therefore, instructors need to set up learning situations that add to self-esteem by making learning interesting, minimizing pressure, and reducing possibilities for embarrassment and failure. Students suggested hands-on activities, lots of discussion, and being included in some of the curriculum planning decisions.

B.F. Skinner, the behavioral theorist, proposed the operant reinforcement theory. He believed that learning could be described in terms of observable behavior; learned behaviors or conditioned responses would then be reinforced (Skinner, 1986). Instructional implications focus on the importance of carefully developing the hierarchical arrangement of responses and initially reinforcing every desired response. Students requested that instructors should make the learning meaningful by showing the reason for lessons and applying the information to practical situations. Providing structured overviews or partially graphic organizers and allowing students to work in cooperative learning situations would reinforce the desired responses.

According to the cognitive theory proposed by Kurt Lewin (1968), learning often results from creating a state of disequilibrium. Dubelle (1986) suggests the use of a moderate degree of tension in the form of

curiosity or puzzlement that provokes a questioning frame of mind. Answering these questions may require some effort, but the result is fairly consistently successful. Students obviously prefer classes that stimulate their imaginations. However, even though the learning tasks are not inherently exciting, students will take them seriously if they find them meaningful and worthwhile. In fact, the degree of effort students exhibit is directly related both to the value they place on the activity and their expectancy of being able to succeed in their efforts. Jere Brophy (1983) calls this motivated expectancy the "expectancy X value" (p. 200). If a task is perceived as too difficult, the student will not set appropriate goals or find value in the instructional experience. With some success, students will begin to perceive that the outcome depends upon their efforts as well as abilities. As a result, Brophy feels that these students will take a more active role in the learning situation, and are "relaxed and task oriented rather than tense and ego oriented" (1983, p. 205). The implications for instruction include preparing students to deal with some degree of frustration and assigning tasks that are not too difficult for students to complete so that they learn to value learning for its own sake. Birkey (1983) suggests that students cannot become independent lifelong learners if they have not discovered how to learn on their own. Students state that they appreciate the teacher's enthusiastic efforts to model his or her continuing involvement in the learning process. The adult educator cannot afford to simply specialize in teaching specific course content or skills, but must become an active participant in the holistic process of relating learning to life goals and promoting learning for its own sake.

The students' interview responses seem to accurately reflect the instructional implications supported by the research of prominent theorists. Adult learners are concerned with both intrinsic and extrinsic factors, but most realize that the need to learn must come from within. Their primary needs include a busy time schedule, varied learning styles, and often low self-confidence in the college environment. In order to promote adult developmental learners' success and persistence in college, it seems crucial to provide an open, caring environment using cooperative learning situations in which the teacher facilitates active questioning and discussion in pursuit of identified goals. Tasks that are meaningful and stimulating to the students need to be structured to assure success with reasonable effort. It also seems to be particularly important that the teacher should serve as a model of an active, enthusiastic member of the learning community who values continuous, lifelong learning. Motivational instructional strategies must continue to provide the bridge to help students persist in their efforts to continue their education and to learn to value learning for its own sake.

## References


*Birkey, C. J. M. (1994). Future directions for adult education and adult educators. Journal of Teacher Education, 35(3), 25-29.*

*Brophy, J. (1983). Conceptualizing student motivation. Educational Psychologist, 18(3), 200-215.*

*Dubelle, S. T. (1986). Effective teaching: Critical skills. Lancaster, Pennsylvania: Technomic Publishing Company.*

*Lewin, K. (1968). The conceptual representation and the measurement of psychological forces. Durham, NC: Duke University Press.*

*Maslow, A. H. (1987). Motivation and personality (3rd ed.). New York: Harper & Row.*

*Skinner, B.F. (1986). Programmed instruction revisited. Phi Delta Kappan, 68(2), 103-110.*

*Valentine, T. & Darkenwald, G. G. (1990). Deterrents to participation in adult education: Profiles of potential learners. Adult Education Quarterly, 41(1), 29-42.*

# Integrating Teacher/Student Learning Preferences with Effective Note-taking

*Dorothy H. Fancher*
*Alpena Community College*

## Abstract

*Note-taking, when taught in relationship to auditory, visual, and kinesthetic learning preferences, enhances students' abilities to process information according to personal styles. While all systems are physical processes, individually, each technique draws upon the characteristics unique to auditory, visual or kinesthetic learners. In order to support the diversity of learning preferences in the classroom, the instructors must recognize their own styles to better facilitate presentation and acceptance of work in other learning modes.*

Learning preferences are known by many labels: learning styles, sensory orientations, and intelligence styles. Preference is a more accurate term in this instance because the ways people process information are choices, not because they cannot learn through any other means but because they prefer to learn in specific manners.

Over the last fifteen years, learning preferences have been widely studied. Rita Dunn of St. John's University has produced several studies and compilations since 1975, including a correlation of eighteen studies (Dunn, Beaudry, & Klavas, 1989), which determined only three of these (Hill & Nunney, 1971; Keefe, Languis, Letteri, & Dunn, 1986; Dunn, Dunn, & Price, 1975, 1979, 1981, 1985) were comprehensive enough to cover all aspects of learning styles. The remaining fifteen focused on a maximum of four elements essential to learning styles and those also stressed the right/left brain modes.

Among the factors that influence learning preferences are linguistics (words and language), spatial relationships (visualization of space relationships), logical/mathematical (sensing patterns and repetitions), musical (beats or meters), kinesthetic (role play and hands-on), interpersonal (relationship with others), and intrapersonal (by self). The majority of these studies focused on students' learning preferences. Carol Marshall (1991) adds the component of teacher learning preference to student learning.

Learning preference is best defined as the way in which knowledge is acquired. Concrete examples or factual input, analysis, and sensory utilization impact on the process of acquiring knowledge. Developmental students seem to readily accept the concept of auditory, visual, and kinesthetic modes of learning as these terms are easily explained through daily life experience. These students need to identify their own learning preferences early in the term so that they may take the appropriate steps to reinforce their ability to acquire knowledge. A simple inventory of learning preferences can be administered and self-scored. Although there are many formal and informal instruments available, the one found in The Adult Learner: Strategies For Success (Steinbach, 1993) is a quick assessment. It can be modified and adapted to suit classroom needs as well.

Visual learners process information by seeing it. This could include reading a textbook, watching a video, looking at diagrams, or viewing demonstrations. Visual learners are the people who "see" the

landmarks when following a map. When attempting to put something together, visual learners will look at the directions and diagrams before they begin. These students acquire knowledge through the eyes.

Aural learners process knowledge by hearing it. These students listen to directions and probably would not get lost. They process information by listening to lectures, hearing instructions and following them; these learners like to be "told" what to do. Reading directions out loud as they attempt to assemble a kit assists the aural people. Auditory learners acquire knowledge through the ears.

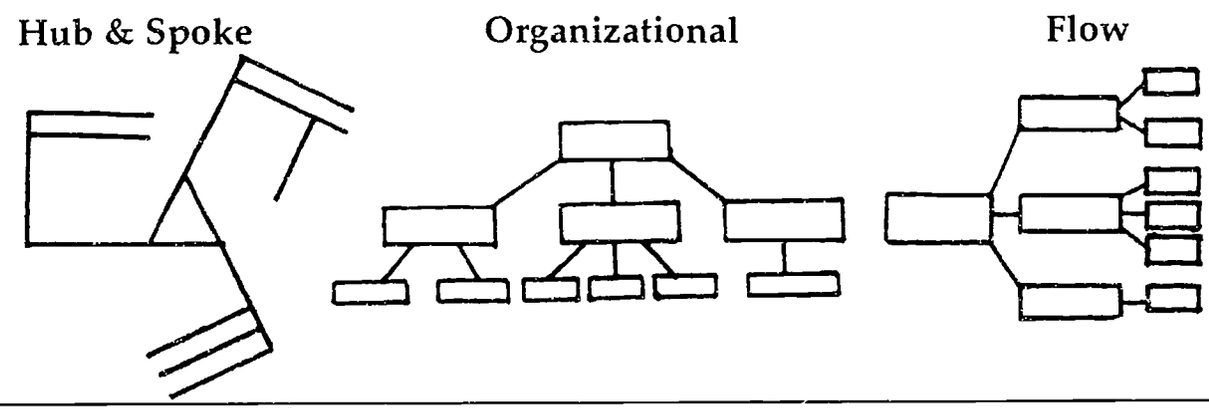
Kinesthetic or tactile learners process information by physical action. They need to be doing, feeling, touching, and manipulating. Kinesthetic students need more physical involvement with the material in order to learn it. These students would rather attempt to put something together without looking at the directions or having them read aloud during the assembling process. Kinesthetic learners acquire knowledge through the body.

Because each of these three learning preferences occur in any given classroom, it is the instructor's responsibility to vary the format of the lecture or class activity in order to suit the needs of the various types of learners. Visual students prefer the type of environment that incorporates overheads, chalkboard presentations, and other visual tools. The instructor can supplement the lecture by referring to handouts or specific pages in the textbook that guide the students to printed material. In comparison, auditory learners prefer to hear the lecture and explanations of any visual aid. The instructor should limit any visual aid to key words and then elaborate upon them with discussion or example. Visual learners will not resent oral reading of the overhead or board if the procedure is rationalized through learning styles. Kinesthetic learners usually take notes because of the physical action involved, but they also appreciate handouts to manipulate and organize.

How does note-taking lend itself to learning preferences? Each of the following four systems—outlining, mapping, summary, and folded-page—has its own special format and draws upon the needs of each preference. Outlining, probably the most popularly taught system, is visual by its linear restructuring of material that represents the relationships of ideas. Visual students "see" instantly the key points and how those points relate to one another. Regardless of whether the students are encouraged to use formal rules of numbering and lettering for each level of specificity or not, visual learners have created a graphic tool for study and acquiring knowledge. If the instructor has also introduced the idea of right-left brain orientation, left-brain or logical thinkers will function better with the structure of the outline.

Mapping, also called clustering, is a newer form of note-taking that utilized both the visual and right-brain aspects of learning and provides for more manipulation of the paper. The three basic types of maps include the "hub and spoke", the "organizational", and the "flow" as shown in figure 1.

Figure 1




The hub and spoke is the least linear in that note-takers begin in the center of the page and branch out in spoke fashion, turning the paper for each new idea. For visual learners, the hub or topic can be enclosed in a geometric shape, such as a triangle, to further reference the number of key points made within the reading or lecture. The organizational map begins at the top of the page and works its way down as the levels of information become more specific. The flow

method works from either side of the page continuing across the page as the levels become more detailed. Both of these maps are visual but are not as manipulative as the hub and spoke.

The third note-taking method is called the summary. Although it is the least visual of all of the systems, it is the most conducive to oral reading. The sentence structure of the summary guides oral readers to the key points that are not readily visible at a glance. The summary may also be one of the most dreaded note-taking systems because developmental students equate the summary to paragraph writing in English class.

The final system is relatively new and researched by Dr. Toni Walters of Oakland University (1990). First called the 1/3-2/3, it is becoming known as the folded-page. The title itself suggests the kinesthetic quality of paper manipulation and visual properties, yet it is certainly adaptable to the auditory use of oral review. The paper must be folded in order to achieve the proper effect, but then can be used for any number of purposes. Essentially, chapter headings, questions, vocabulary, rules, names, etc., are written on the small folded portion of the paper. On the inside of the fold, students may summarize the headings, answer the questions, write definitions, list the steps to accomplish the rules, or indicate the significance of the name to be learned. Since students cannot read both sides of the paper at once, self-testing and higher levels of thinking become a positive component of this system. Students who are visual learners "see" the whole picture of the material to be learned; auditory learners can vocalize the material or encourage another person to assist with the review process, and, of course, kinesthetic learners will need to open and close the paper continuously in order to write the necessary information.

Regardless of the instrument used to assess students' learning preferences, the instructor must be aware of the preferences within the classroom and address the lesson/lecture to meet those needs. By providing a variety of note-taking techniques to the students, the instructor has also authorized student ownership and responsibility for success. The students are made aware of the style they prefer to use when acquiring knowledge and can then incorporate the means which strengthen that preference.

## References

*Dunn, R., Beaudry, J., & Klavas, A. (1989). Survey of research on learning styles. Educational Leadership, 46, 50-58.*

*Dunn, R., Dunn, K., & Price, G. E. (1975, 1979, 1981, 1985) Learning styles inventory. Lawrence, KS: Price Systems.*

*Hill, J., & Nunney, D. (1971). Personalizing educational programs utilizing cognitive style mapping. Bloomfield Hills, MI: Oakland Community College.*

*Keefe, J., Languis, M., Letteri., & Dunn, R., (1986). Learning Styles Profile. Reston, VA: National Association of Secondary School Principals.*

*Marshall, C. (1992). Teachers' learning styles: How they affect student learning. The Clearing House, 35(8), 225-227.*

*Steinbach, B. (1993). The adult learner: Strategies for success. Menlo Park, CA: Crisp Publications.*

*Walters, T. (1990, March). Notetaking while reading a textbook. Paper presented at the Michigan Reading Association Convention, Grand Rapids, MI.*

# A Teaching Excellence Program for Developmental Education

*Christine Hall*
*Carol Atnip*
*Cathy Leist*
*Ruth Miller*
*The University of Louisville*

## Abstract

*The developmental studies unit at The University of Louisville provides a program of general incentives for professional development and specific orientation and training within the areas of reading/study strategies, writing, and mathematics for lecturers. New teachers receive a lecturer handbook, which includes a copy of the form used for evaluation. A series of workshops addresses particular instructional topics. A developmental teaching internship is available for inexperienced lecturers. Professional development incentives include support for conference attendance and developmental instruction grants. The senior lecturer program rewards professional activity. This network of opportunities contributes to the excellence of the developmental studies faculty.*

At The University of Louisville a special division admits underprepared students and provides a variety of support services for all university students. The developmental studies unit is a part of the division and offers courses in reading, study strategies, writing, and mathematics. The majority of developmental courses are taught by part-time lecturers, a situation common among developmental education programs (NEA, 1988; Boylan and Bonham, 1992; Gappa and Leslie, 1993). The developmental studies unit provides a series of training and orientation activities specific to its instructional programs, as well as several general professional development incentives. These activities address the needs of new instructors who often have had no prior training in developmental education (Abraham, 1992; Stahl, Simpson, and Hayes, 1992). They also function to build community, increase cooperation, and create excellence among veteran teachers in continuing in-service experiences.

A lecturer handbook is provided for new teachers as a part of their initial orientation. The handbook was developed after consulting with experienced lecturers about their needs for information. The handbook does not attempt to reproduce policies that are easily available from other published sources, but instead concentrates on information particular to the developmental studies unit and referrals to other sources. The topics covered include the following: university general information; university and community services; lecturer information; and developmental instruction programs in reading/study strategies, writing, and mathematics. The sections on the instructional programs include course descriptions and sample syllabi.

One of the forms provided in the handbook is the lecturer evaluation form. All lecturers are evaluated yearly by a classroom observation or a conference with the program coordinator to discuss a current teaching unit. The evaluations rate lecturers in the areas of instruction/content relationship with stu-

dents, and professional responsibilities. The evaluation process provides valuable feedback to both the lecturer and coordinator and serves as the basis for reinforcing or improving teaching practices.

Each semester begins with a staff meeting for all developmental studies lecturers and includes a session of general interest. More specific instructional staff meetings and colloquiums follow during the year. Samples of past topics are specified in Figure 1.

The developmental writing program provides training for portfolio assessment used in developmental writing courses modeled on the Stony Brook, New

**Figure 1**

## GENERAL INSTRUCTIONAL STAFF MEETINGS

- The Role of a Developmental Unit in a University
- Insurance Benefits for Part-time Lecturers
- Assisting Extremely Distressed Students
- History of Local African-American Education
- University's College Orientation Course
- Legal Issues for College Classroom Teachers

## INSTRUCTIONAL PROGRAM STAFF MEETINGS AND COLLOQUIUMS

### Mathematics

- Collaborative Learning and the NCTM Standards
- The Role of Athletic Counseling: Success in Mathematics Courses
- Articulation Concerns Between Developmental and University-level Mathematics
- Video: "Math is a Four Letter Word"
- Learning Styles/Instructional Styles

### Writing

- Cultural Plurality in the Writing Classroom
- Recognizing and Teaching the Dyslexic Student
- Portfolio Evaluation in the Writing Classroom
- Positive Response to Student Writing
- Developing Basic Writing Units Collaboratively

### Reading/Study Strategies

- Use of the Optimism Pessimism Scale
- The Use of Portfolio Assessment
- Cooperative Learning in the Developmental Classroom
- Recent Trends in College Reading
- Staff Idea Exchanges

## Collaborative Staff Meetings and Colloquiums

- "The Instruction of Reading and Writing Skills; Working with the Deaf/Hard-of-Hearing Students" - Reading and Writing Programs
- "Changing Attitudes: Pairing Algebra with Study Skills" - Mathematics and Reading Programs
- "Minorities in the Classroom" - Writing and Reading Programs
- "Critical Reading and Learning" - Reading and Writing Programs

York, system described by Peter Elbow and Pat Belanoff (1986). Portfolio evaluation encourages more collaboration among teachers as they discuss folders representing students' best revised work for the course. Each semester new and experienced teachers meet for "calibration" sessions (Elbow & Belanoff, 1986) before midterm and final portfolio evaluation to read sample papers and discuss whether or not the papers should receive passing grades.

The writing center also administers the university placement test in writing and conducts regular training sessions for evaluating the tests. Instructors who teach developmental writing and freshman composition read the tests holistically and place students in the course best suited to their writing level.

One of the most intensive options provided for training is the developmental teaching internship. The internship is available to people who have earned the necessary degree in the teaching field but who lack appropriate teaching experience. This in-house program places potential teachers in the developmental classroom to observe experienced instructors. The program coordinator arranges instructional experiences for the intern, including classroom observations and discussion of relevant resource references. The intern prepares a syllabus and teaches some sessions under supervision. Both the intern and the program coordinator prepare a written evaluation of the experience.

A small fund has been devoted to supporting general professional development opportunities for lecturers. For example, lecturers can apply for support to attend professional conferences. Registration costs are often paid to attend local or regional conferences, and additional funds may be awarded for travel, with priority given to lecturers who are presenting conference sessions. Lecturers may also apply for developmental instruction grants for projects that improve teaching or learning in developmental courses. Projects may involve curriculum, methodology, assessment, or faculty development.

The senior lecturer program was established to recognize the experience and leadership of developmental studies teachers. Senior lecturer status may be conferred after three years of service and is based on teaching performance, program contributions, and professional activity. Senior lecturers receive a higher rate of compensation for teaching.

The developmental studies unit attempts to provide a comprehensive program of training, orientation, and professional development for all lecturers. Activities range from workshops on specific topics to more general incentives to encourage professional growth. This network of opportunities contributes to the excellence of the developmental studies faculty.

## References

*Abraham, A. Jr. (1992). College remedial studies: Institutional practices in the SREB states. Atlanta, Georgia: Southern Regional Education Board.*

*Boylan, H., & Bonham, B. (1992, February). Exxon Project: The state of the art in developmental education (part II). Paper presented at the 16th annual conference of the National Association for Developmental Education, San Antonio, Texas.*

*Elbow, P., & Belanoff, P. (1986). Portfolios as a substitute for proficiency examinations. College Composition and Communication, 37, 336-339.*

*Gappa, J., & Leslie, D. (1993). The invisible faculty. San Francisco: Jossey-Bass Publishers.*

*National Education Association (1988). Report and recommendations on part-time, temporary, & nontenure track faculty and appointments. Washington, D.C.: National Education Association. (ERIC Document Reproduction Services No. ED 294 477)*

*Stahl, N. A., Simpson, M. L., & Hayes, C. G. (1992). Ten recommendations from research for teaching high-risk college students. Journal of Developmental Education, 16(1), 2-8.*

# Your Teaching Experiences and Students with Disabilities

*Bonnie MacLean Hodge*
*Jennie Preston-Sabin*
*Austin Peay State University*

## Abstract

*This colloquium provided an overview of the research project entitled, "Teaching Strategies and Accommodations for Students with Disabilities", which has received funding from NADE through the Professional Development Scholarship Award. Participants shared individual experiences while discussing four case studies of students with disabilities. With limited expertise in nontraditional teaching methods, instructors are searching for effective means to successfully work with this diverse population of students. This session was intended to provide a forum for concerned educators to discuss their successes in teaching these students.*

Educators in developmental education have a wealth of practical knowledge useful to all educators in higher education. Frequently, developmental studies classes are the first classes taken by students with disabilities. The size of this population of students is increasing and educators are responsible for providing equal access to these students. This session presented some of the findings obtained while searching for practical information from developmental educators across the nation through a research project entitled, "Teaching Strategies and Accommodations for Students with Disabilities." This endeavor was funded in part by the 1993 NADE Professional Development Scholarship Award.

The project was initiated in response to the needs of educators who have limited expertise in the realm of "special education" and limited time and resources for the investigation of individual student needs. The objectives outlined in the original project proposal were twofold: first, to identify teaching strategies and/or accommodations for students with disabilities through anecdotal essays written by classroom teachers; second, to compile this information into a book that is of practical use to any classroom teacher. A call for essays was sent to all NADE members. After a series of reviews and revisions, thirty essays were accepted for compilation in a resource book for educators. Each of these essays clearly shows that the greatest resource available in education is the practical knowledge exhibited by instructors working daily in partnerships between themselves and students with disabilities, as well as the partnerships formed by the networking of educators with the common concern of equalizing opportunities for student success in the pursuit of educational goals. Continued project development has made it increasingly apparent that educators are searching for effective means to serve students with disabilities. This, in turn, is helping to pave the way towards a new era of cooperative, responsible, and creative education for all students (Jones, 1993).

The session was highlighted by interviews with four of the essay authors. The first interview was with Maxine Elmont of Massachusetts Bay Community College based on her essay entitled, "Don't Overlook the Obvious." In the introduction of her essay, Maxine wrote, "In our search for new techniques and methods to better help students reach their potential, to enjoy success and accomplishment, we often overlook the obvious." The essay continued by emphasizing the importance of instructors beginning relationships with students based on open and honest communica-

tion, which will translate into trust. She profiled a student called Carl whose behavior indicated serious emotional problems. Maxine outlined a process of constant reassurance and limit setting through which she was able to slowly guide Carl into formulating reasonable career options which in turn led to successfully reaching his career goals. Maxine continued her essay by writing, "Perhaps the basic key to working with persons who are disabled is time, patience, and the comfort and discomfort level of the instructor." She concluded with, "There is no place for pity. Empathy not sympathy is necessary if these students are to achieve in academe and succeed in the world of work" (Hodge & Preston-Sabin, 1994).

The second interview was with Mary Mattson-Scirocco from DeKalb College, Georgia. Mary profiled Maureen, a student with Attention Deficit Disorder, in the essay entitled, "Building Houses: A Case Study of Directed Reading Journals in the Composition Classroom." When Maureen read selected passages, she had little or no comprehension. Writing a journal while reading a passage enabled Maureen to concentrate and interact with the reading assignment. Writing in the journal provided her with a record of what she had read, which in turn gave her the springboard that was necessary for her to initiate the writing process. In the essay, Mary quoted Maureen when they compared her writing processes before and after the use of reading journals. Maureen said, "I guess it was like trying to build the attic before you would build the basement, and paint it even before you put on the siding" (Hodge & Preston-Sabin, 1994).

The third interview was with Andra Dorlac of Jefferson College, Missouri, who submitted the essay, "Hiding behind the Hair." Andra's essay profiled a long-haired male student with a hearing impairment that had slipped between the cracks and whose hearing difficulties had never been properly revealed by school authorities. Andra wrote that the student was on the verge of dropping out but once the hearing difficulty was recognized and additional testing revealed a learning disability, special services and accommodations were provided to him. Once there was "awareness and some accommodations in the educational settings, he was able to graduate. He was a different person, with renewed self-esteem". Helping all students achieve confidence in themselves is a goal of all educators (Hodge & Preston-Sabin, 1994).

The final interview was with Deann Christianson from University of the Pacific in California. Her essay was coauthored with Elaine Werner and was entitled "Teaching Elementary Algebra to Learning Handicapped College Students: A Case Study." Deann and Elaine's essay profiled Terry, a student with a learning disability in mathematics. They summarized several accommodations made for Terry, but primarily focused on her assets, excellent verbal and social skills. The school's Mathematics Resource Center was important to Terry's success. At the center, Terry received guidance in exploring study strategies and her learning style to capitalize on her strengths. Deann and Elaine pointed out that all students are legally entitled to reasonable accommodations and ethically entitled to our best efforts (Hodge & Preston-Sabin, 1994).

The responsibility for accommodating students with disabilities is one that is faced by all educators in higher education. Accommodations are not "special things" that "special people" know. Accommodations are part of good teaching. The final outcome of the project presented in this session will be to develop a manuscript for a book to submit for publication. This manuscript will address the instructor's legal responsibilities, will provide information about disabilities through current research and anecdotal essays based on practical teaching, and will discuss future issues in working with students with disabilities. The expertise of educators working daily with students with special needs will thus be available to all who work in higher education.

## References

*Hodge, B., & Preston-Sabin, J. (1994). Teaching strategies and accommodations for students with disabilities. Unpublished manuscript.*

*Jones, B. (1992, Fall). Enabling the learning disabled student. Belmont, CA: The Keystone*

# Project College and Career

*Marjorie L. Illingsworth*
*Ronald D. Illingsworth*
*University of Alaska Fairbanks*

## Abstract

*Project College and Career is designed to meet the needs of non-traditional adult students attending college. It is directed at those students who might be at special risk of dropping out. These students are often agency funded, low income, and minority. They need support in this new environment so they can build a strong academic foundation, experience success, become connected with the university, and foster a positive self image. The program encourages the student's retention and success within academic or vocational education programs. Follow-up continues during the subsequent semester.*

Project College and Career (PCC) is an intensive three week seminar. It is designed to offer a structured, yet comfortable and supportive environment for non-traditional and at-risk students returning to academic or vocational education programs. The three week seminar is offered at the Downtown Center close to counseling, tutoring, computer labs, and other student support activities. The academic work and schedule within the seminar offer a realistic introduction to college work and the impact it will have on all aspects of students' lives. Students are then placed into appropriate classes in which they have the greatest opportunity to succeed. Additionally, they are encouraged to take a specially developed three credit course, Skills for College and Career Success, that encourages and assists students in applying what they have learned to other courses they are taking. PCC staff and participants provide a support network during the seminar and the subsequent semester.

PCC was designed to meet the needs of a culturally diverse returning student population that expects to participate in one of the many academic and vocational education programs offered by the University of Alaska Fairbanks (UAF). PCC stresses supporting the student in this new environment by integrating instruction and review in basic academic areas, study skills, and tools to deal with intrusive issues such as child care, transportation, money, non-supportive relationships, funding agency requirements, substance abuse, health issues, and handicaps. In the process, the student begins to build a stronger, more positive self-image.

Adult students returning to college are a common sight at UAF. This population is extremely diverse. Some of the students are parents or grandparents with dependent children; some are single, some are married, others are divorced; they have adult children, or extended families, or they are alone. They represent an age span of fifty years or more. Every racial group is represented. They come from every socioeconomic level from the very poor whose only income is the Pell Grant, through the comfortable middle class, to the wealthy. They are all seeking one thing - information. Whether they enter the educational scene for an occasional course, for an associate's degree, a bachelor's degree, or post graduate degree, they are looking for information that will satisfy their curiosity, improve their position in their current job, or lead to employment.

Returning adult students also represent a diverse academic background. They display a range of academic skills even more varied than the other characteristics of their backgrounds. Some graduated from high school with high academic standings (though graduation may have been many years before). Some graduated in academic programs, others from a non-acade-

mic track. Some barely graduated and some come from schools with minimal requirements. Some did not graduate at all.

These students are often agency funded, low income, and minority. They need support in a new environment so they can build a strong academic foundation, experience success, become connected with the educational institution, and foster a positive self image. This encourages the student's retention and success within the academic or vocational education program. However, these agency funded students seeking entrance to the university are at special risk of failure because of multiple factors such as: (a) lack of academic preparation, (b) lengthy periods since their last educational experience, (c) lack of an educational plan or clearly stated goals, (d) little or no guidance in course selection, (e) non-familiarity with university procedures, (f) low self-esteem and confidence, (g) no awareness of how outside issues will impact their education, (h) few study skills, (i) no awareness of faculty expectations, (j) little or no successful experience with any academic system, (k) no knowledge of university and community support systems or how to access them, (l) vulnerability to personal crises that impact educational progress.

## Program Design

Research seems to indicate that integrated programs that include the following elements have the potential of greater empowerment for the students involved: (a) careful evaluation and placement of students in appropriate courses; (b) a full range of counseling and other student support services; (c) integrated coursework in reading, writing, and math designed to eliminate or overcome individual student limitations and to provide a "preview" of college work; (d) tutoring and skill labs as a built in part of course support; (e) study and college survival skill training (systems training) that relates to student experiences; (f) personal development skill training which helps to empower students in the acquisition of their own education; and (g) development of a shared sense of community.

In developing the PCC curriculum special emphasis was placed on teaching developmentally, addressing individual learning styles, understanding and adapting to different teaching styles, and addressing issues that face the non-traditional student population in ways they would understand and would have relevance to their experiences. The following Project goals were identified:

(1) Introduce culturally diverse new and returning adult students to the university.

(2) Reinforce basic academic skills (math, writing, reading, computer word processing).

(3) Teach effective study skills based on an understanding of individual learning styles.

(4) Promote the personal development of the students by teaching the skills needed to build self-esteem, make effective decisions, set goals, communicate effectively, understand expectations, and to deal with anxiety, stress, and other health issues.

(5) Prepare students to deal with the reality of external issues that may intrude on the educational effort.

(6) Assist students in coordinating their use of available student services to meet their special needs.

(7) Provide follow-up support for these students as they enter their first semester so that new skills are applied and difficulties are spotted early and dealt with appropriately.

PCC is formatted as an intensive, integrated three week seminar offering a structured, comfortable, and supportive introduction to the educational process. The full eight-hour day encourages the student to recognize from the beginning that going to school is a full-time commitment. The material presented introduces study strategies, personal development skills, and tools to deal with intrusive issues along with a review of basic academic skills (math, writing, reading, and computer word processing). Innovative programs for math and writing include manipulatives to teach both math and writing processes, audiotape drills, and student to student tutoring and study groups. Study skills are content directed and reading is from the discipline areas. Personal development and intrusive issues are addressed in the context of the actual educational situation rather than as hypothetical situations.

Students also receive academic and career counseling, evaluation of academic skills, and assistance with class registration. They use tutoring services and learn how to qualify for them. Students discover the math, writing, reading, and computer labs. They participate in support services such as single parent/displaced homemaker and non-traditional programs and are introduced to other support services offered by the university.

The three week seminar is directly linked to a semester long Skills for College and Career Success (DEVS 101) course. This course was developed as a follow-up course for PCC but is not limited to PCC

participants. This integrated skills course reinforces the skills introduced in PCC. Its developmental delivery and emphasis on discipline-based application of skills fosters a lasting change in personal habits and attitudes. The integration of the newly learned skills into academic courses gives the best opportunity for student success. Directed study sessions (supervised study labs) allow students an additional resource to address individual study needs during this critical first semester.

The students eligible for participation in PCC are especially vulnerable to personal problems. These problems are often overlooked because they are not part of the academic world, but more often than not are the real reason non-traditional students are not retained in college. These intrusive issues—child care, transportation, money, non-supportive relationships, funding agency requirements, substance abuse, health issues, and handicaps — if not dealt with can quickly snowball out of control. Regular contact with PCC staff in directed study sessions, developmental classes, and follow-up counseling allow for early intervention and can be used to assist the student to link with campus and community support. Students are empowered to solve problems successfully and continue with the academic task at hand.

## Project College and Career Content Outline

Not all non-traditional students have problems entering post-secondary education. Many are very successful. Agency funded students can also be successful, but these students recognize that they have a disadvantage starting out in the post-secondary system. Student questions and concerns were collected using formal interviews, evaluative questionnaires, student opinion of instruction faculty evaluations, journal entries, and assigned composition essays. The issues identified by the students were then reviewed and integrated into the PCC program as a part of the needed content. A key concern that surfaced in all the interviews related to how the university system functions. Addressing this concern became a thread that ran throughout the entire program. Content then divided itself into the following areas:

1. Re-entry skills include practical information on a wide variety of issues from how to dress to developing supporting relationships that will assist re-entry and retention in college.
2. Academic skills provide an intensive review of basic math, writing, reading, and computer skills needed to function in college classes.
3. Personal development skills focus on personal health habits, stress management, dealing with fears.
4. Self-esteem refers to recognizing self-esteem as the foundation of all satisfying and successful endeavors, and providing an atmosphere that allows a student to overcome "learned failure" and build a positive self-esteem that enables progress toward goals.
5. Goal setting and decision making involve defining goals and using them to give direction to career preparation and progression and making effective decisions. This includes both short and long term goal setting.
6. Personal management skills emphasize that managing resources often makes the difference between success and failure. Students are introduced to management skills and apply them to time, money, and other resources to maximize opportunity.
7. Communication skills encourage using effective communication as the basis for successful interaction and problem solving with peers, colleagues, and instructors.
8. Recognizing and managing intrusive issues focuses on fostering an awareness that life issues affect college performance, introducing tactics to manage these issues, and an understanding of resources available to assist the student in developing an action plan to successfully continue educational progress.
9. University Systems training promotes understanding the formal and informal structures of the university and how these structures impact students in all areas of college life. Understanding the structure of the university and how it functions is one of the least recognized but most easily remediated skills necessary for college success.

## Conclusion

This project has worked well for the students attending and for the agencies involved. Of the 70 students who have been involved in the PCC seminars, 56 students (80%) have completed at least one semester following PCC. GPAs for these students are strong; many have earned 3.5 or better in their first full semester.

# Effective Writing Conferences: Teaching and Learning, One to One

*Margaret Kantz*
*Mary Ragland*
*Ginger Young*
*Central Missouri State University*

## Abstract

*Writing conferences are widely accepted as being conducive to substantive teaching and learning. Because they are a basic strategy for many teachers, it is worth asking how they can be made more productive for both teachers and students. Strategies for increasing writing conference effectiveness include setting agendas, asking questions, giving suggestions, reinforcing learning, emphasizing general rules, and being positive. The authors have produced an instructional videotape that uses these strategies as guidelines for creating unique interactions with students from culturally diverse backgrounds.*

Although a number of books and articles have been written on the subject of holding writing conferences, none seem to emphasize the flexibility needed on a highly culturally diverse campus. This conclusion resulted in the decision to make a videotape to give graduate assistants, new faculty, and English education students a brief, high impact orientation to giving effective writing conferences.

The videotape focuses on six principles, each illustrated with vignettes from actual conferences. These six principles represent a distillation of commonly accepted wisdom about teaching writing: (a) setting an agenda, (b) asking questions, (c) reinforcing learning, (d) emphasizing general rules, (e) giving choices, and (f) being positive. All are based on the assumption, articulated by Murray (1979) and others, that the purpose of a writing conference is to empower students, not to tell them what to do. The temptation to dominate the conversation sometimes appeals to inexperienced teachers. However, passive students tend to carry out instructions without learning how to improve future writing and tend to feel less responsible for the quality of the finished essay.

Setting an agenda helps prevent a scattershot approach. Generally, content and organization should be emphasized before surface errors are dealt with (Reigstad & McAndrew, 1984) because, as papers change, surface errors may change or disappear. Also, students must learn that error-free papers lacking content will not be strong. The teachers' job is not to edit studens' writing; it is to help them learn to improve their own work. That is most effectively done by asking students to think about just a few problems during a single conference or to focus on problems that the teacher has explicitly clustered by type.

Conference agendas vary according to students' needs. Reading papers aloud is a good way to set up an agenda because it enables students to hear what they have written and to know how the teacher is reacting. Because setting an agenda demonstrates power, teachers need to be conscious of their tone and of the manner in which they communicate their concerns in order to avoid offending or discouraging students. Agendas should be flexible; if a change in approach seems justified, teachers and students should feel free to renegotiate. By taking control of the agenda, students articulate goals for their work (Flower & Hayes, 1980) and thus learn about their composing processes. Toward the end of the conference, a summary helps students know what to do in the next draft or for the next assignment. Teachers should not necessarily do the summarizing; students should be able to communicate plans, using insights gained during the conference.

Effective questions encourage students to be actively involved in critiquing and revising their papers. These questions often begin with words like "what," "why," or "how." For example, "What do you like about this paper?" Open-ended questions encourage students to think as they work with teachers to produce good papers because the answers do not require a set body of knowledge that coincides with the teachers'. Thus, students are freed from the possible embarrassment of not knowing the "right" answer. Leading students in the right direction requires that teachers think on their feet because these questions

often must be designed on the spot. Sometimes, teachers must work hard at rephrasing questions to help students think through problems. Telling students what to do can be easier and quicker, but encouraging them to think and discover how to solve their problems teaches them more. Teachers should give students time to think and respond. When this technique succeeds, students will internalize the questions and use them to guide their composing (Murray, 1979; Newkirk, 1984).

At times, students might be confused by the questions or just not have any ideas, or they might come to the conference with clearly visualized problems but be unable to solve them (Flower, Hayes, Carey, Schriver, & Stratman, 1986). By giving suggestions, teachers help these students feel comfortable, and may even get them off the hook. To avoid the appearance of telling students what to write, teachers can phrase the suggestions as choices. Insisting that frustrated students come up with responses totally on their own can create an adversarial climate because a frustrated student might think, "The teacher knows the answer and is keeping it from me." Multiple suggestions help increase students' vocabulary and awareness of the possibility of variations in expression. They also convey that the teacher truly cares about the student's writing because she is collaborating, not just evaluating. While appreciating suggestions about vocabulary and phrasing, non-standard dialect speakers may at the same time want to protect their personal expression, creativity, or voice (Young, 1992).

Another basic principle of effective writing conferences is to reinforce what previously has been taught. Teachers should help students see their particular problems as examples of concepts that have been covered more generally. Specific errors should be related to general rules; before students can correct their own work, they must recognize their errors and diagnose their exact nature (Flower, Hayes, Carey, Schriver, & Stratman, 1986). Rules take on meaning and importance when the students can see how understanding and applying them can help improve present and future papers. This understanding will help them avoid repeating these errors. In a sociolinguistic sense, giving a rule is helpful in at least three ways:

(1) It helps students from hierarchical cultures feel more confident in the teachers' expertise.

(2) The existence of a rule implies that many people make this particular mistake.

(3) In the case of non-standard dialect speakers, a rule implies that the error would be generally recognized by writers of standard English (Young, 1992).

The paradox of the writing conference is that teachers, who are in a position of power, are working to transfer that power to students. To assume this power, students must have faith in their writing abilities. Otherwise, they may become discouraged, and the conference will only reinforce their belief that they cannot write. Conferences should contain positive elements that indicate belief that students can succeed and that teachers enjoy working with them and do care about them. A compliment can be given right before a constructive criticism. Other supportive strategies include saying "we" and "us" when referring to the paper, indicating interest in the topic, giving reasons for comments, beginning and ending on a positive note, and sharing personal ties to the topic.

For students of most cultures, praise is an important element in the desire to work toward progressive writing improvement. However, Taiwanese students, for example, may not know how to respond to compliments and may simply be silent. Also, excessive praise that comes across as insincere may do more harm than good. Furthermore, positive reinforcement can be implicit (Young, 1992). Nonverbal messages also are important. Glancing at a wristwatch, for example, can distract students and make them think they are taking up too much time. Students need to feel that they and their papers are the teachers' top priority.

The instructional videotape developed to demonstrate these six principles has many potential uses. Its segmented structure makes it adaptable for use in many different formats. It can be shown to graduate assistants, peer tutors, new instructors, and English education students. It can be used in faculty development workshops and other kinds of outreach activities. In particular, its emphasis on the unique nature of each conference and the resulting adjustments of approach needed when working with students from culturally diverse backgrounds makes it a useful contribution to the literature on writing conferences.

## References

*Flower, L., Hayes, J. R., Carey, L., Schriver, K., & Stratman, J. (1986). Strategies of revision.* College Composition & Communication, 37(1), 16- 55.

*Flower, L., & Hayes, J. R. (1980). The dynamics of composing: Making plans and juggling constraints. In L. W. Gregg & W. R. Steinberg (Eds.),* Cognitive processes in writing *(pp. 31-50). Hillsdale, NJ: Lawrence Erlbaum Associates.*

*Murray, D. M. (1979). The listening eye: Reflections on the writing conference.* College English, 41, *13-18.*

*Newkirk, T. (1984). Anatomy of a breakthrough: Case study of a college freshman writer. In R. Beach & L. S. Bridwell (Eds.),* New directions in composition research *(pp. 131-148). New York: The Guilford Press.*

*Reigstad, T. J., & McAndrew, D. A. (1984).* Training tutors for writing conferences. *Urbana, IL: National Council of Teachers of English*

*Young, V. H. (1992). Politeness phenomena in the university writing conference. (Doctoral dissertation, University of Illinois at Chicago).* Dissertation Abstracts International, *53, 4236A. (University Microfilms No. 9310163).*

# Opportunity for Developmental Faculty: Videotape Project

*Cathy W. Leist*
*Woodrow A. Hammons*
*T. Dan Kesterson*
*Mary Jane Mullins*
University of Louisville

## Abstract

*Funded by a mini-grant for faculty development, this project on collaborative learning resulted in a set of videotapes and a handbook for training developmental faculty in implementing collaborative activities in college developmental classes. Two instructors were videotaped using collaborative activities in their classes. A handbook including a written description of each of the five classroom activities videotaped was developed. Using selected excerpts from the classroom videotapes, an introductory videotape was produced presenting basic information and encouraging instructors to try collaborative learning activities. The introductory tape concludes with a panel discussion in which the instructors involved answer questions commonly asked about collaborative learning.*

For several semesters instructors in this institution's reading and study skills program have been interested in collaborative learning as a teaching strategy for precollege courses. Research suggests that when done correctly, collaborative learning tends to promote higher achievement, more positive relationships among students, greater social support, and greater self esteem. These goals are particularly important to the success and retention of high-risk students (Johnson, Johnson, Holubec and Roay, 1984; Johnson and Johnson, 1987).

The project members videotaped two developmental instructors in their classrooms while they were conducting collaborative learning activities with students. The result was five unedited videotapes of activities: (a) a fishbowl activity used to teach communication techniques, (b) a note-taking puzzle activity, (c) a defense contractor simulation, (d) a textbook study strategy, and (e) note-taking activities. In addition to providing the five tapes for staff use, the group decided to create an introductory videotape to accompany the classroom activity tapes. The introductory videotape and an accompanying handbook enabled the group to present introductory information about collaborative learning shared during its discussion sessions, and to illustrate the planning, implementation and evaluation of a collaborative activity by using excerpts from each of the videotaped classroom activities. To create the introductory videotape, the group identified and selected parts of the classroom videotapes to illustrate each point, wrote an introduction, and listed questions instructors commonly ask about collaborative learning that were answered in a panel discussion. The result was a thirty-seven minute introduction to collaborative learning videotape.

The instructors provided written descriptions of each classroom activity to be used as part of a handbook on collaborative learning. Besides written descriptions of each videotaped class, references for nineteen research articles on collaborative learning were also included.

Copies of the introductory tape, classroom tapes and the handbook are on file in the reading and study skills resource room. Instructors may borrow the videotapes and handbook to observe exactly how collaborative activities have worked in their colleagues' developmental classrooms, and to learn how such techniques might be applied in their own classes. Instructors have used these materials to implement collaborative learning in their developmental classrooms. One has provided an additional classroom videotape and description of another collaborative activity to add to the collection in the resource room. The materials produced by the group project are especially useful for part-time developmental reading instructors who can conveniently share colleagues' collaborative learning lesson plans and visit their classes via videotape.

## References

Johnson, D. W., Johnson, R. T., Holubec, E. J., & Roy, P. (1984). Circles of learning: Cooperation in the classroom. Alexandria, VA: Association for Supervision and Curriculum Development.

Johnson, D. W., & Johnson, R. T. (1987). Learning together and alone: Cooperative, competitive, and individualistic learning. Englewood Cliffs, NJ: Prentice Hall.

# Beyond the 3 Rs: Fostering Student Responsibility

*Patricia McClure*
*Barbara Henry*
*West Virginia State College*

## Abstract

*Recently colleges have experienced the enrollment of large numbers of nontraditional, less than well-prepared, and first-generation students. At West Virginia State College, faculty began raising concerns that included excessive student absence, student reluctance to use the library and campus services, and classroom disruption. The articulation of those concerns led to a series of workshops planned by the Office of the Vice President for Academic Affairs. Out of the 1992 faculty workshops came two documents: "Student Responsibilities and Expectations," which is the focus of freshman orientation sessions, and a one-page addition to all first-and second-year syllabi.*

In the fall of 1991, the Vice President for Academic Affairs at West Virginia State College was appalled to hear professors campus-wide speak of a growing number of problems in the classroom, problems of a non-academic nature that affected academic performance. Such behaviors included tardiness, poor attendance, rudeness, confrontations between students and students and between students and professors, and students who complained about routine assignments such as outside-of-class reading requirements. The Vice President for Academic Affairs decided to devote the two-day faculty meeting at the beginning of the semester (Spring, 1992) to this urgent issue and appointed an ad hoc committee to plan the sessions. As the ad hoc committee explored the issue, it became apparent that the problems were not relegated to developmental and lower-level courses; thus, all faculty needed to become involved in the solutions.

Many students who enter West Virginia State College are in the "at risk" category, ill-prepared for academic work and having no notion of what college entails. A recent survey, intended to provide a profile of the incoming freshman class, provided the following insights: Almost one-half of the group (47 percent) indicated that neither parent completed college; more than three-fourths are employed full or part-time or are seeking employment; and only one-third indicated a composite ACT score of 20 or higher, a generally accepted indication of preparedness for freshman-level work. However, in the same survey, 59 percent indicated that they planned to study three hours or less per week for each three credit hour course they were taking (Fordham, 1994). Fordham's findings are consistent with conclusions reached in Southern Regional Education Board (SREB) studies of first-time freshmen needing remedial and developmental courses. These conclusions indicate an increase in the number of at-risk students over the past ten years (Abraham, 1991).

As a result of widespread concern, the ad hoc committee and the Vice President for Academic Affairs planned workshops involving the following components: A full-faculty meeting devoted to presentations on effective classroom techniques (aimed at nontraditional, first-generation students), syllabus preparation and the importance of accessibility of faculty; and small-group sessions, each with a facilitator and recorder, which brainstormed a list of problems and suggestions for improving motivation, dealing with absence and tardiness, improving student awareness of the availability of instructors, and handling disruptive episodes.

An important function of the small-group sessions was that they served as "gripe" sessions, providing all faculty members an opportunity to air frustrations in addition to offering constructive solutions. At the end of these sessions, recorders (secretaries from various academic departments) compiled and typed the brainstormed small-group lists. On the following day, lists were scanned for commonalities; a list of positive student behaviors was compiled; and methods of encouraging those behaviors were set forth. Acceptable behaviors included regular attendance, conferencing with the professor, and managing outside activities. Faculty members suggested ways to bring about or reinforce these desirable behaviors, including putting rewards in the syllabus. While emphasizing that the student is responsible for class performance, the faculty also wanted to project a "caring" attitude. During the Spring Semester (1992) the document "Student Expectations and Responsibilities" was drafted by a committee of division chairs. This document is now the focus of freshman orientation sessions, where it is presented and discussed. Students sign a tear-off sheet to indicate that they have read and discussed the document. Their signature on the tear-off sheet admits them to registration. [A copy of "Student Expectations and Responsibilities" may be obtained by writing to Dr. Barbara Oden, Vice President for Academic Affairs, Campus Box 192, West Virginia State College, P. O. Box 1000, Institute, WV 25112-1000 or calling 304-766-3043.] A second document (a one-page version) is used as an addition to the syllabi of all developmental, first-and second-year courses at the college.

Nothing radically new or different is contained in the documents; most faculty members already subscribed to the expectations. The importance of the documents is that they are the product of an effort on the part of the entire faculty and that the expectations are now in writing. The process of arriving at the expectations gave faculty members from diverse disciplines a chance to share experiences. There is every reason to believe that, as the composition of the faculty changes, the documents will be revised. More documentation is needed to ensure that positive benefits are being derived from the student expectations instrument. In addition, one department has proposed similarly structured workshops dealing with the issues of sexual and racial harassment. When all faculty members have input into the solutions, faculty are more willing to implement them in the classroom, thus benefitting students.

## References

*Abraham, A. A. (1991). They came to college? A remedial/developmental profile of first-time freshmen in SREB states. (Issues in HigherEducation, No. 25.) Atlanta: Southern Regional Education Board.*

*Fordham, D. A. (1994, January). Preliminary report to faculty: Survey of incoming students. Data presented at West Virginia State College Semi- annual Faculty Meeting. Institute, WV.*

# Developing Visualization and Spatial Skills

*Jan Melancon*
*Loyola University*

## Abstract

*Research indicates that if students are able to visualize, they have a much greater chance for success in mathematics. The most consistent gender differences in mathematical ability have been found in the area of spatial skills. Research suggests that male spatial abilities are responsible for the higher achievement and greater interest of males in math and science. Training can increase visualization and spatial skills in females so that their performance in mathematics equals or surpasses that of males. A variety of techniques that take a minimum amount of class time are available and may improve these skills in all students.*

"Again the atoms were gamboling before my eyes...My mental eye...could now distinguish larger structures...all twining and twisting in snakelike motion. But look! What was that? One of the snakes has seized hold of its own tail, and the form whirled mockingly before my eyes. As if by a flash of lightning I awoke." These were the thought processes of Kekulé (1964, p. 118), the chemist, during the dream in which he discovered the structure of the benzene ring.

Nikola Tesla, inventor of the fluorescent light and A-C generator, "could project before his eyes a picture, complete in every detail, of every part of the machine. These pictures were more vivid than any blueprint." He could further develop inventions "by having them run for weeks (in his mind) after which time he would examine thoroughly for signs of wear" (O'Neil, 1944, p. 38).

Albert Einstein wrote "the words of the language, as they are written and spoken, do not seem to play any role in my mechanism of thought. The psychical entitles which seem to serve as elements in thought are certain signs and more or less clear images which can be voluntarily reproduced and combined... Conventional words or other signs have to be sought for laboriously in a secondary stage, when the above mentioned associative play is sufficiently established and can be produced at will" (1945, p. 142).

These are the thoughts and descriptions of people, great people, who used their mind's eye to guide them in their endeavors. How individuals develop the ability to visualize and conceptualize spatial properties and what factors affect the development of these cognitive structures are still unanswered questions (Rosser, 1980; Shar & Guslin, 1980). Bruner (1973) has argued that we have not begun even to scratch the surface of training in visualization. Spatial visualization has been shown to be related to mathematics performance (Fennema & Sherman, 1977, 1978; Sherman, unpublished; Battista, 1994) even though previously the importance of that relationship was not fully appreciated (Very, 1967).

Jean Piaget, in his stimulating research involving children's mathematical thinking, was concerned with imagery, concepts of space, spatial relationships and the changes that these concepts undergo (Piaget & Inhelder, 1971) Although some have disagreed with his findings (Dodwell, 1963; Kapadia, 1974; Martin, 1976), Piaget believed that a child's spatial system is organized around topological properties. He argued that children have a developmental sequence for spatial thinking in which they visualize topologically first. They then progress to thinking in Euclidean spatially organized structures and finally become able to work with abstract objects in accordance with Euclidean characteristics. While Piaget has characterized spatial thinking as a development sequence, Lohman (1979) has conceptualized spatial thinking in terms of three spatial categories; spatial relations—mental rotation of a visual stimulus, spatial orientation—how a stimulus appears from various perspectives, and visualization—the internal reproduction of spatial information, i.e., the mental unfolding of geometric shapes (Rosser, 1980).

The ability to mentally rotate and manipulate figures seems to be the skill most directly related to success in geometry. Meserve (1973) says that even the most abstract geometrical thinking must retain some link with spatial intuition. According to Bronowski (1947), many mathematicians believe that beyond the level of simple computation all mathematical thought is based on geometrical concepts. Smith (1964) even describes mathematics as a visual rather than verbal language. These views seem to be fairly widely accepted; so much so that often mathematical concepts are introduced visually and geometrically, i.e., number lines and graphing (Burnett, Lane & Draft, 1979).

Although much material designed for instruction in mathematics courses relies on spatial analogues to convey conceptual ideas, formal curricula offer little to foster spatial skill acquisition (Brinkman, 1966; McGee, 1979). "Neglecting instruction in spatial competence could discriminate against the less spatially minded student, erecting a barrier that may later impede success in future math proficiency" (Rosser, 1980, p.2).

Research on spatial competence to date has dealt mainly with gender differences in spatial conceptual ability. It has been found that spatial visualization is more related to math performance for girls than for boys (Sherman, 1980). Despite findings that males are superior to females in spatial ability (Anastasi, 1958; Fruchter, 1954; Maccoby & Jacklin, 1974; Smith, 1964; Tyler, 1965), Sherman (1978) and Moses (1980) have found that genetic factors are not the cause of these differences. With proper instruction, females can perform as well as males at creative visual thinking and problems requiring spatial ability (Moses, 1980).

Females who score low on tests of spatial skills experience difficulty in accomplishing many tasks required in problem solving. It appears that low spatial males are better able to compensate for their lack of spatial skills than are low spatial females. They might, for example, use a verbal approach to problem solve instead of visualizing numerical relationships or drawing pictures (Tartre, 1990).

These findings suggest a need for a better understanding of processes involved in the development of spatial visualization skills. It has been found that spatial abilities of both males and females improve as they become more involved with such tasks as model building, working with 3-dimensional objects, and solving spatial visualization problems (Skolnick, Langbort & Day, 1982). Educators can help teach these important skills.

The purpose of this paper is to provide a rationale for the presentation of some techniques to teach visualization skills. Many of the techniques use manipulative materials. Bishop (1973) has found that children taught in primary schools where manipulatives were used tended to perform better on spatial ability tests than children from schools where manipulatives were not used. Even in adulthood, activities such as these can improve spatial task performance (Gagnon, 1985). Activities demonstrated for eventual student use include visualization exercises for which certain images are suggested and participants picture them (McKim, 1980), tangram and other paper folding exercises (Fair, 1987), mirror imaging (Winter, Lappan, Phillips & Fitzgerald, 1986), and viewing three-dimensional objects from different perspectives (Seymour & Beardslee, 1988).

In summary, the techniques briefly discussed here are intended to improve students' capabilities of visualizing mathematical concepts. It appears that visualization improves spatial skills and promotes interest. The techniques have been employed with both high school and college students. The effectiveness of the techniques remains to be empirically investigated. These studies are currently being conducted.

## References

*Anastasi, A. (1958). Differential psychology: Individual and group differences in behavior (3rd ed.). New York: MacMillan.*

*Battista, M. (1994). Greeno's environmental/model view of conceptual domains: A spatial/geometric perspective. Journal for Research in Mathematics Education, 25(1), 8794.*

*Bishop, A. J. (1973). The use of structural apparatus and spatial ability - A possible relationship. Research in Education, 9, 43-49*

*Brinkman, E. H. (1966). Programmed instruction as a technique for improving spatial visualization. Journal of Applied Psychology, 50, 179-184.*

*Bronowski, J. (1947). Mathematics. In D. Thompson & J. Reeves (Eds.), The quality of education. London: Muller.*

*Bruner, J. S. (1973). Beyond the information given. London: Allen & Unwin.*

*Burnett S. A., Lane, D. M., & Dratt, L. M. (1979). Spatial visualization and sex differences in quantitative ability. Intelligence, 3, 345-354*

*Dodwell, P. C. (1963). Children's understanding of spatial concepts. Canadian Journal of Psychology, 17(1), 141161*

Einstein, A. (1945). Quoted by Hadamard, J. in The psychology of invention in the mathematical field. Princeton NJ: Princeton University Press.

Fair, J. (1987). Tangram Treasury. Cuisenaire Company of America.

Fennema, E., & Sherman, J. A. (1977). Sex related differences in mathematics achievement, spatial visualization, and socio-cultural factors. American Educational Research Journal, 14, 51-71.

Fennema, E., & Sherman, J. A. (1978). Sex-related differences in mathematics achievement and related areas for further study. Journal for Research in Mathematics Education, 9, 189-203.

Fruchter, B. (1954). Measurement of spatial abilities: History and background. Educational and Psychological Measurement, 14, 387-395.

Gagnon, D., (1985). Videogames and spatial skills: An exploratory study. Educational Communications and Technology Journal, 33(4), 263-275.

Kapadia, R. (1974). A critical examination of Piaget-Inhelder's view on topology. Educational Studies in Mathematics, 5, 419-424.

Kekulé, F. von. (1964). Quoted by Koester, A. in The act of creation. New York: Macmillan.

Lohman, D. F. (1979). Spatial ability: A review and reanalysis of the correlational literature. Technical Report No. 8 of Office of Naval Research and Advanced Research Projects Agency Contract No. N00014-75-0882, Stanford University.

Maccoby, E. G., & Jacklin, C. N. (1974). The psychology of sex differences. Stanford, CA: The Stanford University Press.

Martin, J. L. (1976). An analysis of some of Piaget's topological tasks from a mathematical point of view. Journal for Research in Mathematics Education, 7, 8-24.

McGee, M. G. (1979). Human spatial abilities: Psychometric studies and environmental, genetic, hormonal, and neurological influences. Psychological Bulletin, 6(5), 889-918.

McKim, R. (1980). Thinking visually. Palo Alto: Dale Seymour Publications.

Meserve, B. E. (1973). Geometry as a gateway to mathematics. In A. G. Howson (Ed.), Developments in mathematical education. Cambridge: University Press.

Moses, B. E. (1980). The relationship between visual thinking tasks and problem-solving performance. Paper presented at the Annual Meeting of the American Educational Research Association, Boston, MA. (ERIC Document Reproduction Service No. ED 187 734)

O'Neil, J. (1944). Prodigal genius: The life of Nikola Tesla. McKay (TartanBooks).

Piaget, J., & Inhelder, B. (1971). The child's conception of space. London: Routledge & Kegan Paul.

Rosser, R. A. (1980). Acquistion of spatial concepts in relation to age and sex, Final Report on Grant No NIE-6-79-0091 from the National Institute of Education, Dept. of Education, University of Arizona.

Seymour, D., & Beardslee, E. (1988). Critical thinking activities. Palo Alto,CA: Dale Seymour Publications.

Shar, A. O. & Guslin, W. E. (1980). Children's spatial-perceptual preferences: A cross-cultural comparison. Journal for Research in Mathematics Education, 11(2), 156-60.

Sherman, J. (1978). Sex-related cognitive differences: An essay on theory and evidence. Springfield, IL: Charles C. Thomas.

Sherman, J. Women and mathematics: Summary of research from 1977-1979 NIE grant. Unpublished manuscript.

Sherman, J. (1980). Related factors: Changes in girls and boys, grades 8-11.Journal of Educational Psychology, 72(4), 467-482.

Skolnick, J., Langbort, C., & Day, L. (1982). How to encourage girls in math and science. Palo Alto, CA: Dale Seymour Publishing Co.

Smith, A. M. (1964). Spatial ability: Its educational and social significance. London: University of London.

Tarte, L. (1990). In E. Fennema & G. Leder (Eds.), Mathematics and gender. New York, NY: Teachers College Press.

Tyler, L. (1965). The psychology of human differences (3rd ed). New York: Appleton-Century-Crofts.

Very, P. S. (1967). Differential factor structures in mathematical abilities. Genetic Psychology Monographs, 75, 169-207.

Winter, M., Lappan, G., Phillips, E., Fitzgerald, W. (1986). Spatial visualization. Reading, MA: Addison-Wesley.

# MBTI Learning Style Preferences and Mathematics Instruction Methods

*Dorothy Newman*
*Charlotte Matthews*
*University of South Alabama*

## Abstract

*To find out if developmental mathematics students with a compatible match between instruction method and Myers-Briggs Type Indicator (MBTI) learning style preference outperform students with an incompatible match, 69 students were randomly assigned to a compatible or an incompatible instruction method. After one quarter of instruction, ANCOVA results, with diagnostic test scores as the covariate and final examination scores as the dependent variable, showed no significant differences between group or subgroup means at the .05 level. Matching instruction method to learning style preference had no effect on final examination scores. Instead of tailoring delivery systems to learning style preferences, instructors should continue to help students succeed under a variety of instruction methods.*

For years educators have debated the merits of matching classroom instruction to student learning styles. Researchers designed this study to determine if matching instruction delivery method, individualization or lecture, to learning style preference as measured by the Judging (more structure)-Perceiving (less structure) scale of the Myers-Briggs Type Indicator (MBTI), affects the final examination scores of students in developmental mathematics classes. Investigators hypothesized that a compatible match would improve mathematical performance.

Subjects for the study were 69 freshmen admitted to the Department of Developmental Studies for Fall Quarter 1991. There were 14 black females, 26 white females, 7 black males, and 22 white males. Eleven subjects—one black female, four white females, and six white males—did not complete the study.

Prior to registration, each student took the department's mathematics placement test and the MBTI, placing into an algebra or arithmetic course and receiving a learning style preference designation, either J (more structure) or P (less structure). Nineteen algebra Js, 17 algebra Ps, 18 arithmetic Js, and 15 arithmetic Ps were randomly assigned to either a compatible or an incompatible instruction method. Instructors, who were unaware of students' J or P designations, taught their courses in the regular manner with the only difference being instruction delivery method, individualization or lecture. Diagnostic test scores, final examination scores, gender and race data were collected at the end of the quarter.

The null hypothesis of no difference between final examination score means for students with a compatible match (lecture Js and individualized Ps) and students with an incompatible match (individualized Js and lecture Ps) was tested at the .05 level using ANCOVA with diagnostic test scores as the covariate and final examination scores as the dependent variable. Final examination score means for the total sample and for various subgroups appear in Table 1. ANCOVA results in Table 2 show no significant difference between the compatible and incompatible group means. In addition, there were no significant main effects for gender or race and no significant interaction effects. As a follow up, researchers also found no significant differences at the .05 level in final examination score means for MBTI types, Js ($M=75.91$, $n=33$) and Ps ($M=75.88$, $n=25$), $t=0.0116$, or for instruction methods, individualization ($M=76.31$, $n=26$) and lecture ($M=75.56$, $n=32$), $t=0.7452$.

For developmental students in this study, matching instruction delivery method to learning style preference as measured by the Judging-Perceiving scale of the MBTI had no effect on final examination scores. Both algebra and arithmetic students purposely mismatched performed as well as those with a compatible match. Matching instruction delivery method to learning style preference seems to offer no particular advantage for developmental mathematics students. Instead of tailoring instruction delivery methods to learning style preferences, developmental mathematics instructors would be better advised to continue helping students succeed under a variety of instruction methods.

**Table 1**
**Final Examination Score Means**

| | | M | n |
|---|---|---|---|
| **Grand Mean** | | 75.90 | 58 |
| **Main Effects Variables** | | | |
| MBTI/Method Compatibility | Yes | 75.[illegible] | 27 |
| | No | 75.90 | 31 |
| Gender | Female | 77.23 | 35 |
| | Male | 73.87 | 23 |
| Race | Black | 75.90 | 20 |
| | White | 75.89 | 38 |
| **Interaction Variables** | | | |
| Compatibility X Gender | Yes/Female | 77.05 | 19 |
| | Yes/Male | 73.13 | 8 |
| | No/Female | 77.44 | 16 |
| | No/Male | 74.27 | 15 |
| Compatibility X Race | Yes/Black | 78.38 | 8 |
| | Yes/White | 74.84 | 19 |
| | No/Black | 74.25 | 12 |
| | No/White | 76.95 | 19 |
| Gender X Race | Female/Black | 77.62 | 13 |
| | Female/White | 77.00 | 22 |
| | Male/Black | 72.71 | 7 |
| | Male/White | 74.38 | 16 |
| Compatibility X Gender X Race | Yes/Female/Black | 80.17 | 6 |
| | Yes/Female/White | 75.62 | 13 |
| | Yes/Male/Black | 73.00 | 2 |
| | Yes/Male/White | 73.17 | 6 |
| | No/Female/Black | 75.43 | 7 |
| | No/Female/White | 79.00 | 9 |
| | No/Male/Black | 72.60 | 5 |
| | No/Male/White | 75.10 | 10 |

**Table 2**
**Analysis of Covariance for MBTI/Method Compatibility Groups**

| Source of Variation | df | SS | MS | F | p |
|---|---|---|---|---|---|
| Covariate—diagnostic Test | 1 | 1111.433 | 1111.433 | 14.626 | .000 |
| Main Effects | 3 | 328.968 | 109.656 | 1.443 | .242 |
| MBTI/Method Compatibility | 1 | 36.420 | 36.420 | .479 | .492 |
| Gender | 1 | 293.726 | 293.726 | 3.865 | .055 |
| Race | 1 | 55.533 | 55.533 | .731 | .397 |
| Two-Way Interactions | 3 | 82.142 | 27.381 | .360 | .782 |
| Compatibility X Gender | 1 | 1.110 | 1.110 | .015 | .904 |
| Compatibility X Race | 1 | 8.648 | 8.648 | .114 | .737 |
| Gender X Race | 1 | 78.377 | 78.377 | 1.031 | .315 |
| Three-way Interaction | 1 | 101.191 | 101.191 | 1.332 | .254 |
| Compatibility X Gender X Race | 1 | 101.191 | 101.191 | 1.332 | .254 |
| Explained | 8 | 1623.735 | 202.967 | 2.671 | .016 |
| Residual | 49 | 3723.645 | 75.993 | | |
| TOTAL | 57 | 5347.379 | 93.814 | | |

# Humor in the Mathematics Classroom? ...But Seriously

*Chuck Nicewonder*
*Owens Community College*

## Abstract

*Introducing humor in a mathematics class, at any level, can help reduce students' math anxiety and make math more interesting. Telling "math jokes" has become a regular part of basic algebra classes at Owens Community College. Mathematical humor can be demonstrated in many forms: direct questions, stories, riddles, fill in the blanks, quotations, and even humorous illustrations. Research shows that besides making a class more fun and interesting, humor also improves students' test grades. The higher the level of mathematics, the more fun a class can be, since getting the humor requires an understanding of the math involved.*

"What do you call a mermaid's undergarment? ...an algae bra!" (Azzolino, Silvey, & Hughes, 1978, p. 42). "What do you get if you add sixty female pigs and forty male deer? ...a hundred sows and bucks!" (Azzolino, Silvey, & Hughes, 1978, p. 10). "What did the acorn say when he finally grew up? ...geometry!" (Azzolino, Silvey, & Hughes, 1978, p. 34).

Telling jokes such as these has become a regular part of algebra classes at Owens Community College. Each class begins with a "math joke." This usually sets a humorous tone for a class that might otherwise be dull. After a few days of class students begin to look forward to hearing a joke or riddle each day, and the students seem much more relaxed. Usually humor is not introduced on test days or when tests are returned because some students are not in a joking mood on those days. But even on test days, some students say, "You didn't tell us a joke today. Why not?"

Besides direct questions, there are other forms of mathematical humor such as stories, fill in the blanks, and simple quotations. The following are some examples:

1. "A little girl asked an elderly woman knitting in her rocking chair, 'Can you help me find the lowest common denominator?' The elderly woman answered, 'Haven't they found that yet? They were looking for that when I was in school'" (Azzolino, Silvey, & Hughes, 1978, p. 13).
2. "Father, to his daughter returning home at 3 a.m., said, 'I told you to be home by a quarter of 12!' The daughter answered, 'But I learned in math class that 1/4 of 12 is 3!'" (Azzolino, Silvey, & Hughes, 1978, p. 17).
3. "John told Mary a joke about decimals but she didn't get the point!" (Azzolino, Silvey, & Hughes, 1978, p. 33).
4. "Eye glasses are good for? . (division)" (Lederer, 1988, p. 102).
5. "When I tell my landlord to come and collect his money I say, ' ? ' (circumference)" (Lederer, 1988, p. 104).

Some of the jokes and riddles are not as humorous as others. Some are very corny. But often the humor is in the corniness of the joke itself, or the reaction of nearly everyone in the class. For example, "Student to teacher: 'Ms. Fair, I couldn't find a half-inch wrench, but here are two quarter-inch wrenches!'" (Azzolino,

Silvey, & Hughes, 1978, p. 15). "A man lay out in the sun because he wanted to become a ? . (tangent) (Lederer, 1988, p. 102).

Other than making the class more relaxed and more fun, is there any educational value in using humor in a classroom? According to scholars and researchers, indeed there is! Avner Ziv (1988) conducted an experiment using two introductory college statistics classes. In one class the instructor used humor to teach the statistics concepts. In the other, the same instructor did not use humor. The final exam scores of the students in the class in which the instructor used humor were significantly higher than in the class taught without humor. He also conducted a follow-up experiment in two psychology classes, and found similar results. Robert M. Kaplan and Gregory C. Pascoe (1977) state that retention of concepts is significantly improved by the use of humorous examples illustrating those concepts. J. P. Powell and L. W. Andresen (1985) report that using humor promotes comprehension and retention, creates an atmosphere in which learning is more likely to occur, encourages student involvement, and holds the students' attention (especially that of many students who would otherwise be unruly or disruptive to the class). They also point out that humor has a valuable place in almost every aspect of human communication, and that humor makes life more fun and interesting.

By introducing humor to the classroom, any mathematics class can be far from boring. In fact, the higher the level of mathematics, the more fun anyone can have, since the jokes and riddles can pertain to all levels of mathematics. The following are more examples:

1. "What math is discussed between seabirds? ...intergull calculus" (Azzolino, Silvey, & Hughes, 1978, p. 43).
2. "Whatz the opposite of a stop sign? ...cosine" (Azzolino, Silvey, & Hughes, 1978, p. 39).
3. "Whatz a parrot apt to do if he sees a cat? ...poly...hed...ron" (Azzolino, Silvey, & Hughes, 1978, p. 38).

These riddles might not be appropriate for basic algebra classes, but certainly would be for higher level mathematics classes. Humor can be introduced into the mathematics classroom at any level. All mathematics teachers have the opportunity to incorporate humor into their classes.

## References

*Azzolino, A., Silvey, L., & Hughes, B. (Eds.). (1978). Mathematics and humor. Reston, VA: The National Council of Teachers of Mathematics.*

*Kaplan, R. M., & Pascoe, G. C. (1977). Humorous lectures and humorous examples: Some effects upon comprehension and retention. Journal of Educational Psychology, 69, 61-65.*

*Lederer, R. (1988). Get thee to a punnery. Charleston, SC: Wyrick & Company.*

*Powell, J. P., & Andresen, L. W. (1985). Humour and teaching in higher education. Studies in Higher Education, 10, 79-90.*

*Ziv, A. (1988). Teaching and learning with humor: Experiment and replication. Journal of Experimental Education, 57, 5-15.*

# Establishing a Training Program for Learning Assistants

*Gary M. Parilis*
*Bob Nelson*
*Rutgers University*

## Abstract

*Administrators of learning centers in postsecondary educational institutions are challenged to find a means to train new student staff members consistently, and should be interested in ways of constructing and implementing a brief, simple, and efficient training program. Such a program should include aids to provide trainees with easy access to information and procedures. This paper offers suggestions for developing a training manual that covers procedures involving the staff members' supervisory responsibilities and instructions for providing learning assistance. It also presents set guidelines for developing an easy-to-construct computer database for organizing learning assistance strategies and resources.*

Many learning centers that provide assistance in learning strategies to students in postsecondary educational institutions are staffed by undergraduate and graduate students who are skilled as students but inexperienced in sharing their expertise with others Consequently, administrators may need to train new staff members frequently, and should be interested in ways of constructing and implementing a brief, simple, and efficient training program. An essential part of such a training program is a manual that covers specific instructions for providing assistance to students and procedures for any other necessary duties, along with a system for organizing the various instructional materials that the staff members will be using.

## The Learning Center Manual

A training manual clarifies procedures and provides trainees with models for their behavior. It clearly outlines their supervisors' expectations of them, thus providing a basis for future evaluation of their performance. Providing new staff members with a written document to which to refer also reduces the amount of information they need to retain during and immediately after the training program, allowing them to remember the most important information more easily.

Preparing a training manual also has benefits for the learning center's administrators. The process of developing a manual helps them to clarify their own thoughts. Furthermore, a well prepared manual creates a perception of legitimacy for the training program and for the learning center itself among trainees as well as upper administrators of the institution.

### Key ingredients for an effective manual

The contents of a staff manual should reflect the goals and characteristics of the individual learning center. The training objectives should be driven by the attributes of the population being served, the services the center provides, and the format in which the instruction is delivered. However, although each center has its own orientation and its own needs with respect to content, there are three necessary elements for an effective staff manual; it must be clear, be specific, and provide examples to illustrate and model behavior.

A manual must coherently outline all procedures in enough detail to serve as a guide for the new staff members' behaviors. Each section should go far beyond the obvious. For example, consider the following passage from a section on diagnosing students:

> It is important to view each student as an individual. Diagnoses can be quite complex, so your diagnoses should always be sufficiently detailed. Make sure to include all of the relevant

information in order to completely understand your student's situation.

This passage does not provide the new learning assistant with any practical information or specific guidelines for behavior. In fact, its ambiguity may actually create confusion. In order to be useful, the manual must be action oriented. It should provide detailed and clear behavioral prescriptions. Notice how the following passage provides trainees with a concrete example on which to model their behavior:

> Many students have similar needs, but they still need to be diagnosed individually. Avoid categorizing your students. An accurate diagnosis should not be simple or reductive, such as, "Keith needs help in reading," or, "Donna needs help in time management." A more accurate diagnosis would be: "Phil has difficulty comprehending and retaining material from difficult readings. He has no problems with texts that are broken down into sections. He pre-reads them, uses chapter summaries as a guide, generates questions from section headings, and so on. But when he is reading a book that goes on for several pages at a time without a break, those strategies are not effective. He also has difficulty selecting main ideas in readings that are not broken down into sections. As a result, he reads in too much detail in the beginning, and then skims through the rest of the chapter when he realizes that he has been inefficient." Specific diagnoses like these are necessary to provide the student with adequate assistance. If your diagnosis simply said that Phil needed help with reading, you might waste your time (and his) teaching him to use strategies that he has already mastered.

This passage is much more effective than the previous one because it uses specific examples of "good" and "bad" behaviors to provide the reader with an understanding and a clear image of the recommended approaches. Although the specific content of each learning center's staff manual will vary, the basic ingredients of clarity, specificity, and examples are keys to its effectiveness.

## The Learning Center Database

A training manual for staff at a learning center that serves many student needs might overwhelm novice staff members if it contains too much information. Learning centers that service diverse populations for a variety of learning assistance needs should consider organizing resource handouts and evaluations of other resources such as videotapes, computer programs, audio cassettes, and books into a simple but comprehensive computer database. A database can be easily constructed by means of user-friendly software.

A computerized database can easily organize an enormous amount of information. With it, a new staff member is provided with a simple, intuitive, and direct path to information needed immediately. In this way, the database alleviates anxiety and instills confidence among trainees by providing assurance that there are accessible methods for dealing with a variety of unpredictable student needs. A database also lends credibility to a learning center. It assures trainees, as well as administrators, that the learning center is organized and has a legitimate method of training its staff. Most importantly, a database permits an evolutionary development of resources and evaluations. It facilitates the exchange of ideas among staff and allows present learning assistants to benefit from and expand on the insights of previous staff.

### The Structure of a Database

To understand the structure of a database, think of it as an electronic record keeping system comprised of layouts, which can be thought of as pages. The layouts contain "fields" (areas where information can be reviewed or entered) and "buttons" (areas that access further information or commands). Buttons can allow the user to call up other layouts containing further information, or they can perform commands such as printing out information or exiting the database. In order to create a database, it is necessary to understand how to create a layout, how to create fields and buttons on layouts, and how to link buttons to layouts. These commands will depend on the type of software that will be used.

Once the information is gathered for data entry, it is necessary to construct a menu layout with buttons representing access to information in general areas, creating direct paths to desired resource material literally at the push of a button. A database must also include a layout that instructs a user regarding how to maneuver through the database. The instruction should be immediately accessible and should indicate how to access, modify, and print the database information. It is also important that the information can be easily disseminated. A learning assistant should be able to benefit from showing others the information; a student should benefit from leaving the center with materials in hand.

## Conclusion

A manual designed to train learning assistants supplemented with a computer database that organizes information and resources will provide learning center managers with vehicles for ensuring the readiness of learning assistants, encourage managers to continually improve upon methods of training personnel, and facilitate the implementation of staff development programs. A manual and an electronic database, used in conjunction, ensure that all information is accessible to all staff members, providing for consistent and effective training, thereby enhancing the quality of support for students.

# Adult Literacy Models: Incorporating Creative and Critical Thinking Development

*Emily Miller Payne*
*Barbara G. Lyman*
Southwest Texas State University

## Abstract

*The creative and critical thinking development of adult basic learners is often set aside out of a sense of urgency that "the basics" should come first. However, critical and creative thinking development can not only revitalize the adult education classroom, but it can draw on the creative strengths and world knowledge of adults without distracting from solid literacy instruction. This summary describes the use of popular models of critical thinking and creativity instruction and suggests ways that teachers can design activities and projects for adult students.*

Adult education programs serve a diverse student population that attends class voluntarily and brings to the adult education classroom a wide variety of educational goals ranging from a desire to learn to read to children or grandchildren to earning a GED for entry into the employment market (Brookfield, 1987). Adult education teachers and researchers recognize that these students bring an impressive array of world experiences to the classroom and that teaching the seemingly disconnected skills and content would be more palatable if it were taught in the context of problems that adults face in everyday life (Shor, 1980). However, in the typical adult education classroom, the urgency to teach "the basics" tends to override teaching the more practically-grounded critical and creative thinking strategies in spite of their applicability and potential to revitalize the classroom.

## Critical Thinking

For adult students, a classroom introduction to critical thinking strategies could be a confirming experience because they use many of these skills in their daily experiences. Critical thinking, in this context, is the goal-directed, and purposeful approach to solving problems. According to Brookfield (1987), critical thinking activities are those that are positive and productive and that vary according to the context. The activities may be emotive or rational and may occur as a result of positive or negative experiences. Successful critical thinkers must learn to identify and challenge assumptions, they must recognize that situational context is important, they must learn to explore alternative solutions, and they should ultimately begin to adopt a world-view of reflective skepticism.

Using the Brookfield critical thinking model as a guide, adult education teachers might begin by polling students about the issues or problems they confront daily; from that list of issues, teachers could create case studies to teach problem solving protocols. A case study can focus on the commonplace, such as how to feed a family of four nutritious meals for a week on $100, or how to find out about and take actions to decrease local environmental hazards.

A useful protocol for use with case studies is the IDEAL Problem Solving Strategy (Bransford & Stein, 1993). IDEAL is an acronym for the following process: Identify the problem, Define the goals of problem solving, Explore strategies and new information that relate to the problem, Anticipate the positive and negative outcomes of different strategies, and Look back

and learn from the experience. Another easy-to-use framework for critical thinking is Halpern's four-question model: What is the goal? What do I know and what to I need to find out? What skills do I need? How will I evaluate the effectiveness of the strategy? (1989).

If case studies seem too complicated to begin with, the teacher may want to teach a critical thinking or problem solving strategy using sets of problems in other sources such as Halpern (1989), Thought and knowledge, Hayes (1989), The complete problem solver, and Whimby, Johnson, & Williams (1993), Blue print for educational change. Later, the teacher may choose to invest in writing case studies.

## Creative Thinking

Many adult students protest that they have no gift for creativity, but that initial lack of self-confidence in their own creative talent may be the result of a narrow definition that limits creativity to writing novels, or painting landscapes, or composing musical scores. If we include such activities as making a new dress out of fabric that previously had been curtains or making an elegant meal on short notice from the ingredients currently in your refrigerator, we have broadened creativity to include many who never thought of themselves as creative or innovative.

Teaching students to be creative, and measuring the results of that instruction, need not be as complicated nor as abstract as it appears. Halpern (1989) offers a definition of creative thinking that also serves as guide for teaching and evaluating creativity in solving problems: The solution/product should be unusual, original, or unique; there should be an appropriate outcome or product; the problem should undergo a redefining; the process may use information that is seemingly irrelevant; the process may find as well as solve problems; the process may connect previously unconnected ideas; and creative outcomes may occur by "accident" when the problem solver is prepared. Notice how many of these guidelines bring to mind recognized acts of creativity: The discovery of penicillin, the invention of liquid paper and post-it notes, and the daily additions to discoveries in the high-tech world of computer design and manufacturing. When adult students protest that they could never be inventors or artists, they often are unaware that inventions and works of art seldom come as the result of a flash of insight, but rather are the result of hard work.

The first step in enhancing creativity is deciding what product or process to tackle. Students might begin with a problem-finding strategy such as a bug list, in which students brainstorm a list of products and processes that inconvenience them. They might begin by thinking of solutions to similar problems that have already been addressed (e.g., magnets on electric can openers to keep the disconnected lid out of the just-opened can). If students need practice applying strategies on simulations, several good sources would be A Whack on the Side of the Head: How to Unlock Your Mind for Innovation (Von Oech, 1983) and The Ideal Problem Solver: A Guide for Improving Thinking, Learning and Creativity. (Bransford & Stein, 1993).

The potential for teaching adults to be critical and creative thinkers along with teaching literacy skills is great; instruction in critical thinking offers students life skills that go well beyond basic reading, and creative thinking strategies have the potential to enhance quality of life in an stressful world.

## References

*Bransford, J. D., & Stein, B. S. (1993). The ideal problem solver: A guide for improving thinking, learning and creativity (2nd ed.). New York. W. H. Freeman*

*Brookfield, S. D. (1987). Developing critical thinkers. Challenging adults to explore alternative ways of thinking and acting. San Francisco: Jossey-Bass.*

*Halpern, D. (1989). Thought and knowledge: An introduction to critical thinking. Hillsdale, NJ: Erlbaum.*

*Hayes, J. R. (1989). The complete problem solver (2nd ed.). Hillsdale, NJ: Erlbaum.*

*Shor, I. (1980). Critical teaching and everyday life. Boston: South End Press*

*Von Oech, R. (1983). A whack on the side of the head: How to unlock your mind for innovation. New York: Warner Books*

*Whimby, A., Johnson, M. H., Williams, E. Sr., & Linden, M. J. (1993). Blue print for educational change: Improving reasoning, literacies, and science achievement with cooperative learning. Atlanta: The Right Combination.*

# On Seeing Black Through Both Blue and Brown Eyes: Teaching African American Literature in Racially Mixed Classes

*Patricia T. Price*
*Margaret A. McLaughlin*
*Mildred M. Pate*
Georgia Southern University

## Abstract

*Eurocentric education has been the foundation of all curricula in the United States for students at all grade levels, but in recent years acknowledgment of cultural diversity and instruction in multiple cultures have become missions in the educational arena. Traditionally, African American instructors have been expected to learn about and teach Eurocentric literature. Now white instructors must learn about and teach African American literature with equal commitment and skill. But teaching African American literature to racially mixed classes requires more from white instructors than a liberal heart and good intentions.*

An important issue is the question of authority: who can talk about African American literature? Is the instructor—who is better educated and older than the students—always a more reliable authority? A related issue is the question of how African American students can be become more empowered in the classroom setting so that they participate more fully in discussions and enrich the reading of all students in the class. Various techniques can be used to help underrepresented groups assume authority. First, reading responses encourage students to interact with a text and guarantee students the right to their own interpretations of a text. Second, the use of small groups for classroom discussions allows students to open up with two or three classmates and gain confidence to speak in larger groups. Third, student writing can be reproduced anonymously for classroom use. Students love to hear each others' work. If students are confident that their names will not be revealed, they have greater freedom and may produce more honest writing. Fourth, we can stop giving "guess-what-is-in-my-mind-and-you'll-get-an-A" type exams. No matter how open instruction is, tests that require students to learn and accept the instructor's interpretation of a text send a negative message and ultimately undermine the progress we make toward empowering our students as readers and writers.

To incorporate these techniques into our classroom, a small group at this university has been using a whole language approach for developmental students. Traditionally, developmental reading and writing classes have focused on functional literacy. That is, they have been based on the belief that the purpose of developmental classes is to help students learn to decode information efficiently and transcribe information correctly. In these traditional classes students are taught that knowledge resides in the text and that to become successful students and citizens, they must learn to decode efficiently and to transcribe correctly. Functional literacy thus focuses on preparing students for the necessities of daily life and the professional duties of a complex technological society. As a result of such instruction, developmental readers and writers too often see the written word as little more than a

gatekeeping opportunity (Bartholomae, 1987; Rose, 1983; Trimmer, 1987).

Whole language courses, however, are based on another conceptualization of the purpose for literacy. Rather than a focus on information retrieval and transfer, whole language curricula encourage students to engage in dialogues with texts to learn more about themselves and others; personal growth can thus be gained through reading and writing. In whole language classes, students read to find meaning that is personally significant to them; there is no single "correct" meaning for a text because meaning is constructed from each reader's transaction with the text. Each reading of a text is, therefore, unique. In whole language classes, students read books and write papers that relate to their experience and to the world they live in (Goodman, 1986; Edelsky, Altwerger & Flores, 1991). Reading and writing assignments can be sequenced to examine any topic that relates to the interests of the students. During the past year a multicultural theme has been used and racial issues explored.

The students in the course begin by reading an autobiography of a young person's coming of age experience. In a reading response to Anne Moody's (1968) Coming of Age in Mississippi, the autobiography of a young black civil rights activist who took part in the sitins during the 1960's, a student named Christy wrote:

> I could not get over how cruel the whites were. It hurts me to know my ancestors had such cold hearts. I believe that maybe all of the whites were not prejudiced; maybe they just did what they were taught to do. When I finished reading this book, I was ashamed of my color, and I couldn't believe my race could have hated someone so much that they would kill and beat them.

A number of students in the class responded to a second text, The Diary of a Young Girl (Frank, 1969), by writing that they had never known any other people had as hard a time as Blacks, but that they now thought that Jews had maybe even worse troubles. By reading the autobiographies of adolescents caught in those time periods, the worlds of these 1990s students were being enlarged.

Unfortunately, however, all too often minority students come to college after years of feeling excluded from the educational system. In a journal entry near the beginning of the quarter, Jacelyn wrote,

> In elementary school and in high school there isn't much in the books that tells about black people. I want to know more about black people besides slavery. I want to know something good about black people. I want to read and learn about black kings and queens. Every year since elementary school in the month of February we learn a little about black history and that is slavery. Maybe to keep hearing about the slavery days will keep black people proud of something. It depresses me. I'm proud of who I am, but I want to know something good about black people. I know that I am studying this in college, but I wanted to know about it in high school.

In a 1992 article, Maxine Hairston argues that instructors should not bring such controversial issues as race or gender into the classroom because she believes such issues can disrupt the learning process. We find more compelling, however, the research that illustrates that individuals comprehend and retain more readily material that includes their own experiences. As Lily Wong-Fillmore and Concepcion Valadez (1986) have argued, the academic potential of all learners, whether culturally different or well within the traditional mainstream, "has the best chance of being realized when their language skills, their social and cultural experiences, and their knowledge of the world are affirmed in school; these are the foundations of academic development" (p. 654).

Students who have read and written about multicultural themes have not only had extensive reading and writing experiences but have also shared the stories of their readings of the texts as well as their own personal experiences. In the process, their imaginations have been enlarged and their lives enriched. What they have learned lead to a shared vision for our society.

## References


*Bartholomae, D. (1987). Writing on the margins: The concept of literacy in higher education. In T. Enos (Ed.). A sourcebook for basic writing teachers. (pp. 66-83). New York: Random House.*

*Edelsky, C., Altwerger, B., & Flores, B. (1991). Whole language: What's the difference? Upper Montclair: Boynton/Cook.*

*Frank, A. (1969). The diary of a young girl. New York: Washington Square Press.*

*Goodman, K. (1986). What's whole in whole language? Portsmouth, NH: Heinemann.*

*Hairston, M. (1992). Diversity, ideology, and teaching writing. College Composition and Communication, 43, 179-193.*

*Moody, Anne (1968). Growing up in Mississippi. New York: Benton Doubleday Dell.*

*Wong-Fillmore, L., & Valadez, C. (1986). Teaching bilingual learners. In M. Wittrock (Ed.). Handbook of research on teaching. (pp. 648-685). New York: Macmillan.*

*Rose, M. (1983). Remedial writing courses: A critique and a proposal. College English, 45, 109-128.*

*Trimmer, J. (1987). Basic skills, basic writing, basic research. Journal of Basic Writing, 6, 3-9.*

# The Role of Institutional Support in Developmental Studies Student Retention

*Ruth Salter*
*AnnGray Noblett*
*Valdosta State University*

## Abstract

*This study examined whether utilization of institutional support programs makes a difference in retention rates of developmental studies students. Statistical analyses were used to examine retention patterns through the first two years of college for 355 developmental studies freshmen who enrolled in college for the first time in September of 1990. Academic support programs were found to have a positive influence upon the retention of developmental students.*

Underprepared students traditionally experience higher attrition rates than regularly accepted students (Bennett and Okinaka, 1989). Allen (1984) argued that the academically underprepared may be the portion of the student body most responsive to institutional retention strategies. This study sought to determine whether differences existed in retention patterns through the first two years of college for underprepared students who used institutional support programs as compared to those who did not.

## Method

The sample included all 355 students who enrolled as first time Developmental Studies (D.S.) freshmen at a mid-sized state university. The students entered college in fall of 1990 and enrolled in developmental courses in one or more areas. Statistical analyses (ANOVA and chi-square) were used to determine what types of institutional support programs influence whether developmental students remain in college. The study compared D.S. students who were still enrolled at the end of two academic years and D.S. students who were no longer enrolled at the end of the study period.

## Results

An examination of various types of institutional support, including an orientation course, peer advising/tutoring, institutionally funded financial aid, dormitory residence, and career planning, indicates that the support mechanisms significantly related to continued enrollment through the first two years of college are those that provide academic support.

Chi-square analyses indicated that students who participated in the college orientation course and made a C or better were significantly more likely to remain enrolled at the institution throughout the two years than those who did not participate or those who earned a grade of D or F. D.S. students who participated in the academically oriented peer advising program had an 86% retention rate, versus a 44.7% retention rate for those who did not.

The influence of three types of institutionally funded financial aid on retention was explored. Both receipt of aid and amount of aid awarded were examined. Chi-square analyses of student employment, scholarships, and short term school funded loans indicated that these variables were not significantly different between students who remained enrolled and

those who dropped out. Interviews, however, supported Murdock's (1990) theory that "no statistically significant difference" represents a positive impact of institutionally funded aid on student retention because the aid allows students who need the funds to remain in school at the same rate as their peers who do not need help. Institutionally funded aid does not help students succeed; it prevents students from being forced to drop out or stop out due to financial pressures. It affords students the opportunity to be academically successful.

Dormitory residence status was not significantly different for retained versus non-retained students, nor was career counseling as indicated by chi-square analyses. Interviews revealed, however, that many students who planned to use career planning and placement services had not yet done so by the time the study was completed.

## Discussion

Developmental studies students enter college with many strikes against them. They often did not plan to attend college and did not prepare to attend college. Although they usually have a family that supports their efforts, they often do not have the "college wise" family members frequently available to assist regularly accepted students. This study, as well as the body of literature that served as its theory base, indicates that developmental studies students are responsive to support efforts on the part of faculty and staff, particularly those efforts that enhance their academic performance.

Interviews revealed that the most important institutional support, from the point of view of the students, comes not from programs, but from people. The efforts of teachers, advisors, and staff members from vice presidents to secretaries and cashiers are remembered by students as reasons that they feel a sense of belonging at the institution.

## References

*Aller, D. F. (1984). Freshman survey, 1984 (Report No. RB-VC102185). Wilmington, NC: North Carolina University, Wilmington, Division of Student Affairs. (ERIC Document Reproduction Service No. ED 278 290)*

*Bennett, C., & Okinaka, A. (1989). Factors related to persistence among Asian, black, Hispanic, and white undergraduates at a predominantly white university: Comparison between first and fourth year cohorts. Paper presented at the Annual Meeting of the American Educational Research Association (San Francisco, CA, March 27-31, 1989). (ERIC Document Reproduction Service No. ED 309 729)*

*Murdock, T. (1990). Financial aid and persistence: An integrative review of the literature. NASPA Journal, 27(3), 213-223*

# Producing and Utilizing Multicultural Videos in Developmental Writing

*Jaime Sanchez*
*Volunteer State Community College*

*Annette Sanchez*
*Nashville State Technical Institute*

## Abstract

*Non-native speakers are often placed in developmental classes. The purpose of this session was to describe a video project to more actively involve international students, provide cultural insight into the international population, and increase a sense of assimilation for the foreign students. A variety of international students from various cultural backgrounds was identified. Each participant was interviewed and videotaped responding to a variety of questions. Classes viewed two interviews followed by discussion and writing of the essays. This project has proven invaluable for increasing awareness, motivating thinking, and providing a greater integration between the students.*

Non-native speakers of English are often placed in remedial and developmental (R/D) classes because they have not mastered English as a second language (ESL). These students do not take an ESL course either because ESL courses are not provided or because some of the non-native speakers are U.S. citizens who prefer not to reveal their foreign origin. In any event, R/D instructors are faced with the challenge of confronting a multicultural class where non-native speakers may be very good writers in their native languages. The purpose of this project was to more actively involve the international student population currently found in institutes of higher learning, an untapped resource in R/D writing.

In exploring the possibilities of the multicultural classroom, the potential benefits of sharing cultural lifestyles and beliefs were apparent. Therefore, we decided to provide a cultural insight into the international population while increasing a sense of assimilation for the foreign students, and we undertook a video project to aid us in this endeavor.

We first attempted to identify a variety of international students and teachers representative of a wide range of cultural backgrounds. Each participant was interviewed and videotaped responding to a variety of questions concerning family life, points of interest found in the country of origin, weather, common leisure activities, the country's main products, food, and so forth. All students answered the same questions, and, therefore, provided a sound basis for comparison/contrast essays in the R/D classroom.

Our classes are now able to view segments of the video and write comparison/contrast essays concerning those interviews. We normally show one student/teacher interview and ask students to take notes in preparation for the essay. We then proceed with discussions and ask students to compare/contrast the information included in the video with their own country.

## Preparation of Video

For those interested in creating a similar video, the first step is to identify groups of students and teachers feasible to be interviewed. These individuals should be willing to participate. It is counterproductive to pressure anybody to take part in this project. Students selected should be knowledgeable regarding their own country, have clear diction, and be outgoing.

The questionnaire should be prepared and discussed with the people to be interviewed before filming the video. It is advisable to obtain written responses to all questions in order to avoid any misunderstanding. It is also important to obtain the necessary release forms before filming the video.

If possible, one should obtain help from the audiovisual department. Nevertheless, it is important to keep in mind that the instructor is the boss. Other people may have interesting suggestions that may help the video look better but may not work in the classroom setting. For example, an audiovisual technician could concentrate on special effects that may distract the viewer from the important concepts discussed during the interview.

For each interview, it is important to include an introduction explaining the objective of the activity, and it is advisable to use some cultural activity at the end of the interview to make the video more enjoyable. This cultural activity may be a song, a dance, or simply the presentation of typical objects or pictures. One should not hesitate to change or eliminate any sequence of the film that may not work in the classroom setting.

## Classroom Activity

For best results, it is advisable that the video include students in the classroom. This will create immediate recognition and facilitate the integration. If that is not possible, it is important to point out that the people in the film are from the same institution.

Before showing the video, the instructor needs to introduce the project and objectives to the students. This explanation needs to include an explanation of all the questions asked. The questions may vary according to the instructor's needs, but the following have proved to be very effective in maintaining students' interest:

1. What type of weather does your country have?
2. What do people do for enjoyment in your country?
3. What places would you recommend to somebody visiting your country?
4. Describe a typical family in your country
5. What are your country's main products?
6. What type of food do people usually eat in your country?
7. In addition to your family, what do you miss most from your country?

Give students a worksheet including all the questions asked as well as the person's name and country of origin. This will make it easier for students to take notes. After this is done, show the video and carry out a discussion. The instructor may prefer to divide students into groups so they can interchange ideas. The instructor should avoid giving an opinion and should ask questions only to initiate the discussion.

The instructor can then ask students to write a paper comparing and contrasting customs in the foreign country with their own. It is important to give students complete freedom on how and what to compare from the video, but they need to be selective. Otherwise, they may include too much information in their papers. It is important to keep in mind that this is a writing assignment. This activity can also be used in other classes, including freshman English, notetaking in study skills, and foreign language classes.

## Results

We have found the video project to be invaluable for increasing awareness, motivating thinking, and creating openmindedness. Foreign students are greatly motivated to participate in the class while non-foreign students become aware of the ethnic diversity in the classroom. In addition, students and instructors realize that, as a country, we have much to learn about foreign cultures. Finally, the video provides a renewed sense of pride and accomplishment for those involved. As a result of all these factors, we have observed a greater integration and openness between the international and mainstream student population.

# Successful Experiences and Outcomes of Cooperative Learning

*Donna Saye*
*Tammy Abbott*
*Georgia Southern University*

## Abstract

*A study using cooperative learning in Developmental Studies Math classes paired cooperative learning classes with "normal" classes. Students in cooperative learning classes had improved attitudes toward mathematics and were better able to solve challenging problems. Two-thirds of the students in the cooperative learning classes passed, but only half of the students in the normal classes passed.*

There has been great concern in recent years about the poor performance of American students in the field of mathematics. This concern has been expressed not only by parents and educators, but by leaders of this nation as well. In its 1989 report, Everybody Counts, the National Research Council stated that the mathematical achievement of American students is far from what is needed for this nation to maintain its position of world leadership in today's technological society. Former President George Bush (1991) declared in part of his America 2000 education plan that by the year 2000 American students"...will be first in the world in science and mathematics achievement" (p.3). Yet, according to Carol Carlson (1992), American students continue to do poorly in mathematics.

Traditional methods for teaching mathematics appear not to be successfully educating the majority of American students. Because those in leadership are pushing teachers to produce better math students, teachers all over the country have begun to look for alternative ways to teach mathematics. One very popular method being experimented with today is cooperative learning. Both in society and the business world, people have long recognized the value of working together to solve problems. David and Roger Johnson (1989) have shown that skills learned through the practice of cooperative learning in the classroom make an important contribution to success in future employment and careers. So why not allow students to work together when solving problems in their mathematics classrooms?

As joint members of the Developmental Studies and Mathematics Departments at a public university in Georgia, we have been concerned with the growing number of students at the college level who have to be placed in the Developmental Studies math program, and with the number of students in the program who do not pass these classes in just one quarter. We began to investigate different methods for teaching Developmental Studies math students. We found many researchers who have cited that students not only make better grades in mathematics while working cooperatively, but they also have a better attitude towards mathematics itself (Artzt & Newman, 1990; Dees, 1991; Johnson & Johnson, 1989, Miller, 1976; Sharan, 1980; Shaughnessy, 1977; Slavin, 1987; Treadway, 1983)

We decided to try cooperative learning. During Fall Quarter, 1992, we each taught one Math 098 class (the lowest level of Developmental Studies math at the university) using traditional styles of teaching—go

over homework, teach a new lesson, and assign homework each day. The method is not only boring, but it also seems that it is not effective for some students. We also each taught a second Math 098 class using cooperative learning. We randomly placed students in groups to work together. Each day we spent about fifteen minutes going over homework and introducing a new lesson. Then the students gathered into groups to work problems related to the lesson described. The students were taught the same lessons every day as those in the traditional classes and were given the same homework assignments. We found that it took less time to go over homework in the classes using cooperative learning, and that students were able to help each other understand things they did not learn during the lesson. This also helped us teach the new lessons more quickly.

The results at the end of the quarter were exciting. In the classes with cooperative learning, 66% of the students passed (made an "A," "B," or "C"), while in the traditional classes only 52% passed. Students must earn a C or higher to successfully exit the Developmental Studies math classes.

A more interesting discovery was that excellent students in the two different class styles still made As, but those borderline students who might have had Fs in the traditional class were boosted to Cs and Ds in the cooperative learning class. In other words, the better students helped those in their groups who had weaknesses.

Perhaps as important as the increased success rate was the students' attitude toward the mathematics classes. The students in the cooperative learning classes displayed a sincere willingness, and indeed eagerness to work together. A survey of student attitudes given to all the students in all four classes showed a noticeable difference between the two groups, with the cooperative learning students having a more positive attitude about this course and mathematics in general. We are convinced that cooperative learning enhances student achievement in mathematics.

## References


*Artzt, A. F., & Newman, C. M. (1990). Cooperative learning. Mathematics Teacher, 83(6), 448-452.*

*Bush, G. (1991). America 2000: An education strategy. Washington, D.C.: U. S. Department of Education.*

*Carlson, C. C. (1992). The metamorphosis of mathematics education. In C. C. Carson (Ed.), E[illegible]us (pp. 1-12). Princeton, N.J.: Educational Testing Service.*

*Dees, R. L. (1991). The role of cooperative learning in increasing problem-solving ability in a college remedial course. Journal for Research in Mathematics Education, 22(5), 409-421.*

*Johnson, D. W., & Johnson, R. T. (1989). Social skills for successful group work. Educational Leadership, 47(4), 29-33.*

*Miller, R. (1976). Individualized instruction in mathematics: A review of research. Mathematics Teacher, 69(5), 345-351.*

*National Research Council (1989). Everybody counts: A report to the nation on the future of mathematics education. Washington, D.C.: National Academy Press.*

*Sharan, S. (1980). Cooperative learning in small groups: Recent methods and effects on achievement, attitudes, and ethnic relations. Review of Educational Research, 50(2), 241-271.*

*Shaughnessy, J. M. (1977). Misconceptions of probability: An experiment with a small-group, activity-based, model building approach to introductory probability at the college level. Educational Studies in Mathematics, 8(3), 295-316.*

*Slavin, R. E. (1987). Developmental and motivational perspectives on cooperative learning: A reconciliation. Child Development, 58, 1161-1167.*

*Treadway, R. T. (1983). An investigation of the real-problem-solving curriculum in the college general education mathematics course. Dissertation Abstracts International, 45, 108A.*

NADE
National Association for Developmental Education
P.O. Box 5922, Carol Stream, IL 60197-5922
Voice Mail 1-800-942-9304, Vmail Box #21418

Non-profit
Organization
U.S.POSTAGE
PAID
Permit No. 255
Athens, GA