NADE Digest

Promoting Communication Among Developmental Education Professionals

Editorial Comments

This Fall 2008 issue of the NADE Digest is made possible by the many people who collaborated over the past year to bring this edition to press. Thank you to the Editorial Advisory Committee, who reviewed our submissions and worked with the authors to get manuscripts completed. Thank you to the NADE Executive Board, who wisely decided to publish the Fall 2008 issue in a timely manner, even if it meant eliminating the Spring 2008 issue.

Kathy Stein's "El Paso's College Readiness Initiative: Cooperation at Work" provides a candid description of one city's program to identify intervention strategies for high school juniors and seniors. With the goal of encouraging college attendance, strengthening necessary skills, and avoiding developmental college classes, El Paso's story reveals useful advice for school districts and colleges striving to prepare students for academic success.

LaRonna DeBraak suggests a shift in focus when working with underprepared students, from a deficit model of skills-based assessment to encouraging students to utilize independent thought processes when participating in interdependent groups. "Independent/Interdependent Remedial/Developmental Student Learners" includes a six-step process of how to create lesson plans that allow students to develop a more self-directed, autonomous approach to learning.

The integrity of best practices and encouraging learners' independence define this issue's articles. In "Using Technology to Build a Community of Writers in Developmental Writing," Alexandria Megeehon employs WebCT as the foundation of a hybrid class, encouraging students to view themselves as "real writers" through meaningful peer reviews online. As a result of Megeehon's work, WebCT is now an integral part of writing instruction at her institution.

Whether students are at-risk in the writing, reading, or math classroom, Gerald J. Calais shows that using learner generated self-explanations increases students' academic performance. "Enhancing the Academic Performance of At-Risk College Students via Self-Explanations" provides detailed scenarios in math and English instruction to illustrate how to integrate effectively learner explanations into the classroom.

We know that technology can support multiple learning styles; Dusti D. Howell offers a variety of approaches geared to visual, auditory, or kinesthetic learners. "Technologies That Capitalize on Study Skills with Learning Style Strengths" guides us through assessing students' strengths, identifying resources, and suggesting methods of introducing these resources to students.

"Sleep is Overrated: The Developmental Education Innovative Research Imperative" calls for the exploration of new learning contexts, new theoretical perspectives, and new analysis techniques. Hansel Burley extends others' call for a new chapter in developmental education research and includes possibilities for creative collaborations and directions.

Finally, keeping apprised of the latest research and best practices, as well as your institution's rules and regulations, is a challenging task for all instructors. When you are part-time faculty, obtaining this information can be even more difficult. Patti Eney, Evelyn Davidson, and Pamlea Lau outline how comprehensive department instructor manuals can make this information accessible in "Instructor Manuals That Reach Beyond the Basics."

Our goal at the NADE Digest remains publishing practical and practioner-friendly articles that promote research and discourse in developmental education. Please consider adding your research and experience to the pages of our next issue. Happy reading!

- Mary Ann Bretzlauf, Mollie Chambers, and Laura Villarreal, co-editors

NADE Digest

El Paso's College Readiness Initiative: Cooperation at Work

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In El Paso, Texas, the public institutions of higher education have joined with area school districts to create the El Paso College Readiness Initiative. Through a great deal of coordination and cooperation among the participating institutions, high school faculty, students, and parents are introduced to the placement test used by the city's community college and university, students are tested, and interventions are provided to the students. The purpose of this initiative is to reinforce the idea of college attendance among high school juniors and seniors and to help them avoid developmental status when they do decide to matriculate.

El Paso, Texas, sits at the juncture of three states and two nations and is home to over half a million people. When combined with the population of El Paso's sister city, Juarez, Mexico, the population jumps to over two million individuals residing in this border community. The population of El Paso County is predominantly Latino/a at 81.7% (U.S. Census, 2003). The U.S. Census Bureau ranks El Paso as the second poorest metropolitan area in the nation with 28.8% of its citizens living in poverty. El Paso County ranks as the third poorest county in the nation at 29.2%, tying with Bronx County, NY (Najera, 2006).

The El Paso region is served by two public institutions of higher education: The University of Texas at El Paso (UTEP) and El Paso Community College (EPCC). Under the former Carnegie system, UTEP held the designation doctoral/research intensive institution (Carnegie, 2000) and served over 19,000 students in Fall 2006 (UTEP, 2007). It is also a Hispanic-Serving Institution (HSI) with 72.5% of the Fall 2006 population self-identifying

as Latino/a (UTEP, 2007). EPCC served nearly 25,000 students in Fall 2004 on five different campuses. In 2003, EPCC was identified as the fastest growing community college in the nation for institutions with a population over 10,000 (Gibbs, 2005); over 84% of the student body is Latino/a.

Both institutions admit a large percentage of students each year who require developmental education. At EPCC, over 98% of all entering students place into at least one developmental education course while at UTEP, approximately 66% of all entering students require at least one developmental education course (THECB, 2004a).

In November 2005, Dennis Brown, Vice-President for Instruction at EPCC, and Richard Jarvis, UTEP's Provost, shared these numbers with the superintendents of the area's twelve school districts. The developmental education numbers generated a great deal of consternation as the majority of UTEP and EPCC students come from the El Paso region. Before the meeting was over, the College Readiness Consortium was created. The mission of this consortium of institutions of higher education and school districts is to reduce the number of El Paso area high school graduates who enter college requiring developmental education.

In order to ensure that the mission of the consortium was met, the lead administrators at UTEP and EPCC reorganized what had been the joint Developmental Education Task Force into the College Readiness Initiative (CRI) Committee. The charge to the new group was to have a plan in place for Spring 2006 that would test area high school seniors for college readiness, provide interventions in those areas where the seniors had not tested college ready, and retest them before graduation.

The test used by both UTEP and EPCC is the College Board's ACCUPLACER. The ACCUPLACER is used to determine college readiness under the Texas Success Initiative (THECB, 2004b). Both institutions also use the ACCUPLACER to determine course placement in reading, writing, and math.

The initial meetings of the College Readiness Initiative

(CRI) Committee, in December of 2005, were attended by representatives from UTEP and EPCC as well as representatives from both Ysleta and Socorro Independent School Districts, which constitute two of the three largest independent school districts (ISDs) in El Paso. El Paso Independent School District, the largest El Paso ISD, opted to wait until Fall 2006 to join the initiative. The represented departments from UTEP and EPCC included Admissions, Testing, Advising, Tutoring, Developmental English, Developmental Math, the Registrars' Offices, and Financial Aid.

KEY ELEMENTS

At the first meetings, four critical elements were decided upon for the Spring 2006 semester. First, a subcommittee was assigned to create an ACCUPLACER Orientation program. The committee felt that many students do not prepare for the ACCUPLACER or do not try their best on the test because they do not understand its importance to their future in higher education. The ACCUPLACER Orientation program was to be ready by the middle of January.

Second, an ACCUPLACER Interventions sub-committee was formed. The purpose of this group was to help identify the ways in which UTEP and EPCC could provide support to the area ISDs in creating interventions for their students who did not score at college level on all three sections of the ACCUPLACER. The sub-committee members felt strongly that the ISDs did not need the higher education personnel telling the secondary teachers how to teach their students to prepare for the ACCUPLACER. The sub-committee did want to share its expertise concerning the content material covered by the ACCUPLACER and in the developmental education courses that students would have to take at UTEP and EPCC if they didn't retest and earn a higher score.

Third, an ACCUPLACER Assessment sub-committee started work on the fundamentals of getting several thousand students tested on their home campuses. Bussing students to UTEP and

EPCC to take the test was not an option. EPCC was already testing in the high schools for dual credit purposes, but it did not have the resources to test all seniors at all high schools in Ysleta Independent School District (YISD) and Socorro Independent School District (SISD). Issues concerning test security, computer availability, costs, proctors, valid IDs, and score reporting to the students came under discussion as policies and procedures were determined.

The fourth subcommittee worked on the technological issues associated with the program. The registrars at both institutions along with technology specialists from both institutions as well as the ISDs made up this sub-committee. They discussed how student applications would be handled, how the score uploads would be transmitted to UTEP and EPCC, and how FERPA issues would be dealt with.

IMPLEMENTATION

By the time the middle of January rolled around, a tentative sequence of events and implementations plans had been developed. YISD and SISD agreed to share the ACCUPLACER Orientation PowerPoint presentation that had been created by UTEP and EPCC with all seniors. All of the participants agreed that high school seniors who took the ACCUPLACER that spring would complete the joint UTEP/EPCC Admissions Application. UTEP and EPCC would cover the cost of the initial tests; the ISDs would determine how the retests would be paid for – whether the ISDs, the campuses, or the students would pay. UTEP would test students in YISD while EPCC would test the students in SISD. Both institutions would help interested ISDs become their own ACCUPLACER test sites. Campuses would have all seniors retested by May. All tests scores would be reported to UTEP and EPCC by the end of May.

Personnel from UTEP's Tutoring and Learning Center and EPCC's Title V Student Success Program worked on putting together the ACCUPLACER Orientation PowerPoint

presentation. A training session for SISD and YISD was conducted in late January at EPCC. The districts sent curriculum directors, teachers, data specialists, and counselors.

Before the workshop date, however, the participants were encouraged to take the ACCUPLACER themselves. The offer elicited some concern as to how well they would do, so score anonymity was offered to all test takers. The purpose of having the district personnel take the ACCUPLACER was to help them get a feel for the manner in which the ACCUPLACER tests, the type of language that it uses, and the manner in which questions are asked. The participants were also encouraged to deliberately answer some questions incorrectly so that they could see how the test branched to easier questions and then worked up to harder questions. Personally experiencing the test format turned out to be very informative and eye opening for the district personnel.

The workshop walked the participants through the ACCUPLACER test using a PowerPoint presentation. The creators of the presentation tried to include every bit of information that they could think of in relation to the ACCUPLACER: its computer adaptive format, sections of the test, skills covered, score ranges, acceptable forms of identification, uses of the ACCUPLACER (Texas Success Initiative and placement), the developmental education programs at both EPCC and UTEP, reasons for doing well on the test (to save tuition and time), sample questions, web sites to help the students prepare for the ACCUPLACER, reducing test anxiety, and test taking techniques. As no one expected the ISD personnel to become ACCUPLACER experts after one training session, a script that detailed the information on each slide was also electronically provided to the representatives.

The ISD representatives were encouraged to look at the presentation and then to determine how much of the information needed to be shared with each of the populations with whom they were encouraged to share the presentation. Students might need one emphasis while parents might need a different approach.

Administrators and staff also needed to become very familiar with all of the information. The districts were encouraged to cut and paste and rearrange the PowerPoint slides to create a presentation that would work best with the populations that they know best and work with on a daily basis. A one-page handout of web sites was shared that gave students opportunities to take practice ACCUPLACER tests and to work on areas of weakness.

Even though EPCC and UTEP offered to cover the costs of the first ACCUPLACER sitting, neither institution had sufficient financial reserves to provide proctors for all of the test sittings at the various high schools. The ISDs stepped up and found the personnel to act as proctors. EPCC and UTEP staff provided proctor training.

In order to ensure that EPCC and UTEP abided by FERPA provisions, the decision was made that the ACCUPLACER test scores would belong to the ISDs and the test scores would be shared with the students by ISD personnel. In addition, as the semester progressed, all of the districts created a form that the students signed releasing their scores to both EPCC and UTEP. EPCC and UTEP also created materials to help the students interpret what their scores meant in terms of placement.

While test security was of great concern to all the participants, so was the secure electronic transfer of test scores to EPCC and UTEP. The districts were provided instructions on how to upload their test score reports to a dedicated server at EPCC. The computer tech at EPCC was then to download the scores to EPCC's student information system and forward the data to UTEP.

Concerning interventions, everyone agreed that they would be left up to individual campuses. Each school would determine if interventions would even be offered during this first round of CRI. In addition, each school would decide if interventions were mandatory or not, when they would be offered (before school, after school, during the day), how long the intervention would last (hours, days, or weeks), and at what point in the semester they would be offered (immediately after the test results were

reported, later in the semester, throughout the remaining days of the semester, or right before the retest).

Results

For a program that had only eight weeks to come together from the day the charge was given until the first ACCUPLACER Orientation training session took place, CRI had a very successful first semester in Spring 2006. While only two ISDs initially agreed to participate in the program, by the end of semester an additional four rural ISDs (Anthony, Canutillo, Fabens, and San Elizario) had asked to participate. By May 2006, 3,543 seniors in El Paso County had taken the ACCUPLACER test before high school graduation. While not all of the districts had time to implement interventions, all of the districts had the opportunity to assess how well their students did on the ACCUPLACER and this led to a renewed commitment to create interventions for the 2006-2007 school year for their students. In many instances, ISDs agreed to start testing their juniors so that students would know at an earlier date where their potential academic problems were and work more effectively with the existing curriculum and with innovative interventions to retest as seniors and leave high school potentially having passed all levels of the ACCUPLACER.

Issues

As with any new venture, especially one that bridges so many secondary and higher education institutions and that includes so many different individuals, numerous issues developed that had to be addressed. Communication issues created the most difficulty. The rapid growth of the program compounded the communication problems. Communication difficulties and rapid growth made accurate and timely assessment of the program challenging.

The entire College Readiness Initiative is premised upon the cooperative goodwill of all of the participants. While the goodwill was ample, the variety of administrative organizations for each institution made the transfer of information from the campuses

back to the districts and vice versa very cumbersome. Reporting lines were often unclear, so descriptions of interventions and information on the duration, location, types of, and participation in the interventions arrived intermittently to the committees in charge of documenting the efforts undertaken that first semester. Follow up attempts to determine what activities each district promoted, along with when, where, and how they happened, were often unsuccessful because while the districts knew who the campus contact individuals were, this information was not always shared with the colleges in a timely fashion. While individual ISDs knew how their students had done on the ACCUPLACER, the transference of that data to UTEP and EPCC was not easy and the lack of an initial consistent delivery format for that information made initial assessment harrowing, tedious, and hard. Everyone probably would have been better served if a clear communication plan had been established at the beginning with specific individuals identified within each district and at each campus for the dissemination of CRI information.

Lessons to Date

However, by the end of the Spring 2006 academic year, all participants in the College Readiness Initiative agreed that not only were the students benefiting from the opportunity to practice with the ACCUPLACER, but so were the districts. As communication lines became better defined and as mutual expectations were formalized, the working relationships between those in secondary education and those in higher education became stronger, more open, and more supportive. As the teachers at the campus level came to realize that the faculty and staff from UTEP and EPCC were not coming to them pointing fingers and laying blame, but coming in an attitude of cooperation and support, attitudes of distrust and suspicion tumbled. The success of CRI has spread throughout the county and in the 2006-2007 school year, nine ISDs participated including El Paso Independent School District, the city's largest district. That year 9,809 students took the initial

ACCUPLACER exam. At this point in time, for the 2007-2008 academic year, all but one of the El Paso County school districts has not only agreed in principle to the goals of CRI, but they have also actively committed to testing their students, providing interventions, retesting, and sharing their results with both EPCC and UTEP.

It should be noted that working within the area ISDs was only stage one of the College Readiness Initiative. As part of the plan for building trust with the ISDs, UTEP and EPCC felt it was important that they, too, demonstrate their willingness to change their ways and create interventions to help students who, at high school graduation, still had not tested college ready. EPCC created an intensive developmental education summer bridge program, while UTEP offered a math review program during new student orientation to all incoming freshmen who still had a developmental math placement.

Both institutions have also been redesigning their developmental education programs and working to provide alternative methods for clearing developmental status rather than through the traditional sixteen-week course. The philosophy of developmental education has changed from one of waiting until the students arrive on campus and then helping them learn the skills that they need for college success to one of assuming that they leave high school having been taught the skills needed for college success and that they may just need a refresher or two in order to demonstrate their college readiness.

The benefits of the College Readiness Initiative are almost too numerous to count. Perhaps the most satisfying result of the work of the last two years has been the creation and strengthening of lines of communication with secondary educators in the El Paso region. Those of us in higher education have learned of the many difficulties and obstacles that secondary educators face as they prepare their students for life after graduation. Likewise, the secondary educators have learned of the academic challenges that face their students as they pass the state mandated high school graduation exam. We have all been enriched by the

interaction that the College Readiness Initiative required of us. Our institutions have benefitted, our students have benefitted, and our region has benefited by our willingness to join in support of student learning.

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Independent and Interdependent Remedial/ Developmental Student Learners

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As scholars continue to debate over the specific skills underprepared students need in order to complete their course of study, perhaps the focus should be on how to tap into students' independent thought processes and encourage students to utilize independent thought to contribute to interdependent groups. Placing value on students' independent (self-directed or autonomous) contributions and encouraging interdependent (group) activities greatly enhances students' ability to obtain their educational goals. The six-step process guides faculty through the process of creating and implementing a strong independent and interdependent learning experience.

INDEPENDENT AND INTERDEPENDENT STUDENT LEARNERS

History is bursting with the individual contributions of those who marched to the beat of a different drummer. Albert Einstein, Benjamin Franklin, and Mahatma Gandhi each left a lasting effect on the world due to their abilities to learn and function independently of others. Winston Churchill commented, "Personally, I am always ready to learn, although I do not always like being taught." Socrates said, "I cannot teach anybody anything, I can only make them think." Carl Rogers knew, "The only kind of learning which significantly influences behavior is self-discovery or self-appropriated learning-truth that has been assimilated in experience" (Rogers, 1961, p. 261).

The terms "remedial" and "developmental" have been used interchangeably but gradually have evolved to the understanding that "remedial" describes basic grammar, reading, and mathematics. In contrast, "developmental" coursework prepares students for a multitude of college courses or programs. Remedial and developmental coursework implementation varies from institution to intuition. Some institutions focus strictly on teaching students the skills necessary to pass competency exams in reading, writing, and mathematical concepts while others offer a variety of remedial and developmental coursework. What courses should be offered remains a question of continuous debate. Instead of focusing on what to teach, time might better be spent on how to integrate independent and interdependent learning strategies. Teaching students to become independent and to work in interdependent groups enables them to learn utilizing a wide variety of sensory input. Independent learning is essentially the ability to create an individual independence of the current thoughts of others, implement individualized decisions, and evaluate one's own ideas. The ability to function and learn independently is a skill that many developmental students are lacking, yet the development of interdependent skills is also necessary to ensure student success.

Independent Learning

Independent learners take responsibility for their learning, become engaged in learning situations, and are self-regulated when necessary (Jones, Valdez, Nowakowski, & Rasmussen, 1995). The ability to think and evaluate information independent of others' interpretations or the current popular belief allows for creative thought and innovation (Isaacson, 2007). Many independent thinkers achieved notoriety, and their individual achievements have benefited humanity (Gelb, 2003). Knowles popularized the idea that independent learning is essential for adult learners (Knowles & Associates, 1975).

Independent learning enables students to transfer learning and skills among various situations. For example, students who are able

to teach themselves how to use a tape measure in order to determine how to measure correctly and cut a board for a building project can relate that information to measure other items for a variety of different projects. Independent learning focuses on empowering students to take responsibility for learning decisions. Development of this skill enables students to use their own resources to discover answers to problems and increases their abilities to build upon their individual knowledge base and to transfer this knowledge to unrelated learning. Independent learning also allows individuals to focus upon topics and ideas that appeal to them. In addition, it allows individual learning preferences to be developed and fostered. Examples of independent learning are self-guided reading, research, and reflective writing activities. Initiative and the ability to be innovative greatly contributes to the likelihood that developmental students will acquire the skills necessary to become independent learners. However, all learning does not take place in isolation. Interdependent learning is also an essential aspect of learning.

INTERDEPENDENT LEARNING

Interdependent activities provide students with peer interaction, a division of work, and opportunities to communicate and share ideas within a supportive learning environment. Interdependent activities should provide clear goals and objectives, and the group work should also encourage students to work together as they collaboratively manage the process of learning. The sharing of dialogue among groups of learners enables students to evaluate their ideas against the ideas of others. Enabling students to test their evaluations and outcomes promotes the development of critical thinking skills. Interaction with peers and instructors develops students' abilities to speak in front of groups and to practice social skills. An active learner is likely to remember more details and to integrate ideas more effectively. Paraphrasing the ideas of others enables learners to translate information into their own words and make it meaningful. Collaborative learning activities also enable students to learn from each other, question their thought processes,

and test their results against the results of others.

Interdependent learning involves interaction among varying numbers of participants and is group centered rather than individual centered. The key to interdependent learning is interactivity. Stephen Covey describes interdependent activity's importance and contribution to the learning process: "Nothing is more exciting and bonding in relationships than creating together" (Covey, 1997, p. 251). Interdependent learning is the development of an intertwined and interconnected outcome that enhances student understanding and values each student's individual contribution to the whole. Interdependent learners have the ability to work independently and as contributors to larger groups; however, specific individual achievement is unrelated to the actions or input of other students (Deutsch, 1962; Johnson & Johnson, 1989). To serve the needs of students, the educational focus for institutions of higher learning should be placed on teaching students the skills necessary to become both competent independent (self directed or autonomous) and interdependent (group) learners.

Techniques for Integrating Independent and Interdependent Learning

In the past, an apprentice developed and learned a particular skill by modeling his master benefactor, utilizing the medium of dialogue, demonstration, and participation, thus integrating independent and interdependent methods. This multi-sensory approach to learning provides students numerous opportunities to develop and integrate new skills. Individual, experiential, and integrated learning activities increase interest and participation. English students may work independently utilizing newspapers, magazines and the Internet while conducting research on a specific topic, such as global warming, for a paper. Individuals' papers could later be contributed to a group global warning newspaper that contains reports from various viewpoints. Another lesson could involve an independent experimental activity such as creating an object out of clay and writing about the experience. Afterward, the students could compare their written experiences with

the clay with the experiences of their classmates and develop a group paper that notes similarities and differences.

To apply this principle to a reading course, a reading instructor could assign a specific topic such as the effects of pollution on the environment, and then, instruct each individual student to identify a specific aspect of pollution that they find particularly troubling. In this example, students would collectively identify their pollution concerns and locate articles that relate to their topic. Afterwards, each student would paraphrase the article in a paper and compose a short speech outlining its contents to share with the class. Lastly, the students would contribute their ideas to a unified paper that outlines their interdependent concerns about the effects of pollution on the environment.

Math students could discover the meaning of stock percentages as they compete against one another for high percentage gains utilizing the stock market section of the newspaper, an interdependent and independent exercise. In another lesson, students could each pick a car they would like to own and determine yearly expenses based on vehicle price utilizing various loan options, yearly fuel consumption, and insurance. This lesson could be expanded to include the cost of operating the vehicle weekly and monthly.

Independent and Interdependent Learning Six-Step Process

My inspiration for the six-step process was derived due to the frustration I felt while attempting to figure out a definite method to help students value their own individual independent thoughts, and to contribute their independent thoughts to an interdependent activity.

The six-step method offered here provides an outline for developing independent and interdependent lesson plans. This example was developed for my developmental English course and prepares students for college English. In this example, the foundation of the six-step method involves assigning each student a specific role or bias with which to identify and conduct research. Assuming a topic of energy sources, the following example demonstrates the process and progression through the six steps.

Step One: Independent Library Activity: Assign each student to a particular energy source group. Energy source groups may consist of coal, nuclear, hydroelectric, wind, gas/oil, fusion, refuse-based fuel, solar, biomass, and hydrogen. Next, within each energy group assign each student a particular biased role to assume (play) while conducting research. Sample roles are scientist, politician, corporation, executive, government official, lobbyist, international organization or association, and environmentalists. For example, a student may be an oil company executive, politician for oil production, lobbyist for ethanol production, member of the cattle association, a farmer producing corn, company executive who uses corn to produce the company's product, executive that produces products that use petroleum to manufacture company products, politician whose platform is green alternatives, etc.

After all students have been assigned their unique biases, each student is given a set of questions to answer keeping in mind his/her biased viewpoint. Typical questions include: Why is your energy source better for America in the long run? How is your view benefiting the economy now or how will it benefit the economy in the future? Who else supports your point of view? What energy source(s) does your bias support? To answer these questions, students conduct research at the library and develop a list of resources.

Step Two: Interdependent Activity: Divide students into groups based upon their energy source. Provide the groups with the website to the World Energy Council (http://www.worldenergy.org) and instruct them to read the section on the upcoming World Energy Congress meeting. Request that the groups answer the following question: Based on your research, what advantage does your energy source offer that you would like to present during the World Energy Congress? During this portion of the process, students provide expertise based on their assigned roles and collaboratively develop a strategy for defending their energy source(s) during the World Energy Congress. Portions of their strategy may include: petroleum is a better energy source than ethanol because ethanol

production will drive up the price of corn or the price of farm land, finding an alternative source to petroleum would be too costly, and petroleum production is the source of many of the jobs within the community. Another group representing ethanol may choose a biased environmental approach, or focus on the benefits to farming communities from ethanol production.

Step Three: Interdependent Activity: Involve students to conduct classroom discussions on alternative fuels and allow students to divide into groups to compose a collaborative compare/contrast paper that identifies two alternative energy sources and outlines the benefits of each. This step requires students to learn from their peers about the advantages and disadvantages of a variety of energy sources. Another activity could include the group's development of a PowerPoint presentation demonstrating the advantages and disadvantages of varying energy sources.

Step Four: Independent Activity: Each student outlines a strategy utilizing the research they conducted, while playing the role of an expert, to write a paper about their energy source. For example, a student who read articles as a scientist in support of hydroelectric power could write a paper on the benefits of hydroelectric power to the world's economy. In contrast, a student who read articles assuming the role of a scientist for petroleum might report on the huge amounts of petroleum in a particular area or on petroleum based products.

Step Five: Interdependent Activity: During class students share individual papers with the class and seek peer feedback.

Step Six: Independent and Interdependent Activity: In step three, students were separated into groups and assigned a particular bias (in this case an energy source) and a specific role while conducting research. In this final step, each student writes one paragraph as the expert for a particular energy source in relation to the assigned role to contribute to a final paper. Each individual's goal is to contribute an expert or role-based paragraph to a group paper that will be used to convince an audience of peers that each particular energy source is essential to fulfill the future needs of the American economy.

The six-step process encourages underprepared college students to develop independent (self-directed or autonomous) skills and provide valuable interdependent (group) contributions to group projects, thus improving their ability to teach themselves and to learn from others.

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Using Technology to Build a Community of Writers in Developmental Writing

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Using technology in a developmental classroom, particularly a classroom platform such as WebCT, can help provide a sense of community in a developmental writing course. The rationale for designing a hybrid developmental writing course is discussed as well as the ways in which students perceived themselves as "real writers" as a result of the way that their writing was submitted and critiqued on WebCT. A blended learning environment has become an integrated component of writing instruction at the two-year branch campus that is the location of this study.

As the lead developmental writing instructor for our campus, I took the opportunity provided by our campus's Title V grant to explore the use of WebCT in a developmental writing course. Our campus is a two-year branch of New Mexico State University (NMSU) and provides students with both beginning and intermediate level developmental writing courses. Students testing into the intermediate level writing course in which this study was conducted have scores that range anywhere between 38-70 on the COMPASS placement test.

I face a significant challenge in my writing courses, since the learners in my classroom do not perceive themselves as legitimate writers. As Shafer (2003) points out, the challenge in writing courses is to get "…students to imagine themselves to be writers – rather than servants of academic protocol" (p. 16). In order to address concerns and to develop a community of writers, I decided to use WebCT in my developmental writing classroom; this was accomplished through inclusion of interactive activities online. The decision to use online-

based technology for the purposes of enhancing instruction is supported by a recent study by the League for Innovation in the Community College (2006), which points to the need for high quality online basic education. The following benefits were anticipated: an increase in active learning strategies, peer-to-peer contact and learning, an increase in teacher-student interaction, and a focus on learner-centered online activities (Carpenter, Brown & Hickman, 2004; Rose, 2004; Graham & Allen, 2005).

Identifying as a Writer

In addition to teaching in a community college and adult literacy setting for ten years, I consider myself a writer, not only because I write (poetry and short stories as well as academic writing such as this) but also because I write in specific ways. I write to learn by taking notes in meetings, in-services, and classes. I write to express my point of view to specific audiences. I write to figure out how I feel about a topic. Because I engage in these activities on a regular basis, I view myself as a writer.

I also view my students as writers. Every assignment that I require in my classes has writing as a core element. My students write to learn, take notes, write in small groups, and share their writing with each other or with me. In both of my developmental writing classes, the class begins with five minutes of directed writing. I make it clear to my students from the first day of class that these writing exercises are intended to warm up their brains and ensure that they are present in class and in the moment. It is the chance for the students to do some mental stretches and to be aware of where they are (in the classroom) and why they are there (to write). In addition, through active participation in the learning process, students develop a sense of belonging to a writing community. Writing products (essays, short paragraphs, etc.) are treated as genuine writing artifacts for critique, discussion, and revision.

I encourage my students to view the writing that they do, no matter how informal that writing is, as writing that exists within a community. This includes writing that is peer reviewed, shared

with a tutor, or shared with the teacher. I also encourage my students to think of writing as an exercise in constructing language and communicating thought. This broadens their understanding that community-based writing includes their comments on their blogs, their email messages, their text messages, even messages on MySpace – in short, any activity in which they engage in written communication. Thus, my challenge is that of helping my students envision themselves as a community of writers: a group of students interacting together, sharing ideas, learning together, building relationships and in the process improving their writing skills.

Technology and Transformation

In my second semester at NMSU-A, I began a pilot project to incorporate WebCT, an online classroom environment, as part of a core component to my CCDE110 (General Composition) course which is the second-level developmental writing course for our program prior to students enrolling in credit-level English. I have included WebCT as a part of my course for the past three semesters, and the pilot work that I and other instructors teaching CCDE110 have done is being used as a model for our institution's credit level Freshman English course. I've continued to include this component in my course because of my students' responses as well as the sense of community that the technological tools engender. In the following section, I will overview the tools available to the instructor and students in WebCT.

WebCT

WebCT is an online classroom environment designed to support either an online course or a hybrid course that incorporates some online elements. In CCDE110 classes, I use four primary tools: email, discussion board, class schedule, and the syllabus. Both the class schedule and syllabus are areas where the basic business information of the course can be posted. Students are required to check the schedule on a regular basis to find out when assignments are due. I hand out one paper copy of the course syllabus at the beginning of the semester; subsequent copies may be downloaded

from WebCT. I use email to communicate with students about missed classes, send them class notes, or send them copies of their essays with my feedback. The discussion board feature is the tool most used by students in my class to post asynchronous discussions using discussion threads. I can control the discussion threads by posting the initial topic, reading and participating in the discussions, and then subsequently closing the topic for discussion at the end of the discussion period.

Semester 1 – Spring 2006

The first semester that I used WebCT in a course, I assumed that my students were technologically savvy since they already constantly made use of email and the Internet. I did not perceive a significant difference between writing in these environments and utilization of WebCT. However, I quickly found that the most challenging part of the project was overcoming student resistance to learning a new technological environment.

In large part, this was my fault. I provided very little support in how to use WebCT in the class. I had too much other content to cover to spend time on how to conduct a discussion online, how to chat, etc. I was also facing the learning curve of figuring out WebCT. While faculty are well-supported in the area of technology, taking advantage of that support takes time. Since I have taught using other platforms online, I did what I do best: clicked on buttons, looked around, and used trial and error to design my course.

I expected my students to do the same, and, more or less, this strategy worked for most students. One student had consistent problems with logging into the WebCT system as well as the institutional network, which detracted from his ability to participate consistently. However, it was not until several weeks into the course that the student was able to adapt to the online environment.

During the first semester, students completed the following online activities: reading discussions, peer critiques of essay

assignments, and writing exercises. Students worked in small groups of three or four students. The students chose their own groups, and (adding an element of team building to the assignment) named their groups so that I could use the group name to identify the discussion thread online.

Reading Discussions. Throughout the semester, students were required to respond to three essays from their textbook (*The Best American Essays,* College Edition) using the online discussion board on WebCT. Each essay in the book was a model for a similar essay that students were required to write. Students were asked to: 1) Post individual responses to a specific reading discussion question for the essay questions focused on specific elements of organization and content for each essay; 2) Respond to each other's thoughts on the discussion board; 3) Summarize the group's discussion at the end of the week.

Peer Critiques. Students wrote three essays during the semester and were required to post the draft of each essay to the WebCT discussion forum. Students reviewed the drafts of those peers who were in their reading group. Students were then asked to write a one to one and a half page letter to their peer discussing content issues and providing suggestions to make the essay stronger.

Writing Exercises. Students also posted writing exercises on WebCT related to specific essays we were reading for the class. One such assignment was a writing exercise in response to Annie Dillard's essay "The Stunt Pilot." Though students most often worked within their small groups, all students in the course could read each discussion going on in WebCT. As a result, many students would post comments in everyone's groups and provide very insightful comments. None of the students were bothered with this; in fact, the discussions seemed more organic and natural when this occurred.

At the end of the semester, I surveyed the students to find out what they thought. While students tended to complain about WebCT (not comfortable with the technology, too difficult to use,

took too much time), they seemed to recognize it as the tool for which I had intended - a place where community could be built.

Student comments included the following:

a. I am a shy person so using WebCT helped me to talk to other students and not be as shy in what I had said. It helped me see what others were trying to tell me about my writing.

b. It helped to know how and what my classmates were thinking.

c. It helped me look at things from someone else's point of view.

d. I felt that it was an open place to express my thoughts and learn or read what other students were thinking. I felt that my thoughts were easier to express and were well developed because I was communcating them through words and not just verbally. I also had 24-hour access to my peers. I enjoyed reading my classmates' reactions or thoughts about my writing but more than that, I enjoyed reading my classmates' essays.

The ability to consider how someone else thinks, to look at an alternative point-of-view, or to read what someone else writes for pleasure - all are things that writers do on a regular basis. Having a forum in which students were able to communicate their thoughts was invaluable in helping these students see themselves as a community of writers.

Semester II – Summer Session 2006

After the first semester, all instructors decided to make WebCT a permanent component of this course. Students were required to complete one hour per week of WebCT work in addition to attending class for five days a week for two and one half hours per day for five weeks during the summer session. WebCT was used for peer review and writing exercises.

One significant change made between spring and summer was the inclusion of several opportunities for students just to read each

other's work. I asked students to post a mini-definition essay in the fourth week of the course and then to read each other's. This activity was distinct from the reading discussions and was used as an opportunity for students to appreciate each other's writing efforts.

At the end of the five-week session, I gave students the same end of class survey as I had given students in the previous semester.

Students said the following about WebCT:

    a. I became very knowledgeable about how others think.

    b. You were able to get good feedback.

    c. They [classmates] have helped me present my ideas in a way my peers understand.

Session III – Fall 2006

During the third semester of the project, I worked toward building better scaffolding to help students use WebCT in real and meaningful ways in their writing community. I began by providing students with an interactive tour of the site. I also set up stations in each area within WebCT so students could practice discussion skills, emailing, and creating and posting attachments.

During this semester, I taught two sections of CCDE110 which ended up being very different from each other. One section consisted of five students who shared their writing spontaneously during class, outside of class and during lab, which is a fifty minute period of time that students are required to spend in a computer lab with the instructor, in addition to class time. Because students were already sharing their work in such ways, WebCT became a hindrance rather than a useful tool early in the semester, so I used it primarily to check their progress for particular writing elements. The second section of CCDE110 was a special class since it was my writing course paired with a reading course. Students in this course took writing on Tuesdays and Thursdays for two hours and five minutes (including lab time) and reading on Mondays and Wednesdays for one hour and fifteen minutes. They became a cohesive community quickly and easily and readily shared their work. However, because

of the class size of eighteen students, we continued to use WebCT to complete peer reviews, as well as reading discussions, as this allowed us more class time to discuss the writing process and work on specific content relative to the students' writing practice. Interestingly, the students chose to use the synchronous chat function on WebCT to conduct a reading discussion while in the classroom computer lab during one session. They chatted with each other using the online chat function but also talked directly to each other at the same time, which had the interesting effect of providing them with both written and oral feedback.

I found that students began to have a change in attitude about the process of writing. They learned to make conscious choices about how to write for different audiences realizing that writing for me is a different kind of writing than writing an instant message on their cell phones. They also learned the value of sharing their writing with their peers and being part of an active writing community.

Conclusion

WebCT has become an integral part of CCDE110 and is now being used by other instructors in our developmental writing courses, as well as our Freshman Composition courses. Using WebCT as a tool in CCDE110 has enhanced instruction and promoted a writing community. Students are engaged in the writing process and quickly adapt to reading each other's work as peers and colleagues. As I continue with this project for the fourth semester, I have noticed how students have begun to respond in similar ways to their peers as I respond, to focus during online peer review on issues of content and clarity, reading classmates' papers as actively engaged readers. Students no longer write comments such as "It's good" but now elaborate on what specific elements of the text make sense and which specific areas need further work so that they, as readers, can understand the point that the writer (their peer) was trying to make. I will continue to integrate this kind of technology in the classroom, while exploring other opportunities to use technology to enhance students' self-identification as writers.

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National Association
for
Developmental Education

33rd Annual Conference
February 25-28, 2009
Greensboro, North Carolina

Enhancing the Academic Performance of At-Risk College Students via Self-Explanations

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Research suggests that student enrollment in developmental level courses at the postsecondary education level increases annually. This is occurring because underprepared and/or nontraditional students' reading, writing, or math skills are inadequate to meet the challenges of college-level work. This article focuses on self-explanations as an instructionally effective approach designed to enhance the academic performance of at-risk college students. Implications regarding these findings are discussed.

Developmental education focuses on the needs of students who are classified as underprepared and/or nontraditional and whose reading, writing, or math skills are inadequate to meet the demands of college-level work (U.S. Department of Education, National Center for Education Statistics, 2003). These at-risk students' needs, moreover, are more conspicuous than ever because student enrollment in developmental level courses at the postsecondary education level increases annually (U.S. Department of Education, National Center for Education Statistics, 2004). Central to this article is the assertion that Siegler's (2002) studies on learner generated self-explanations can be employed to enhance the academic performance of at-risk college students in reading, writing, and math.

According to Siegler (2002), a major challenge facing educational establishments centers on the need to design pedagogical procedures that are instructionally effective. In meeting this challenge, designing effective instructional procedures, Siegler and his

colleagues employed studies specifically to analyze the encouragement of learners to develop self-explanations. In the next sections, first, the focus is on Siegler and his colleagues' examination of why the encouragement to produce explanations is a desirable instructional technique. Second, what research (Siegler, 1995) has to say regarding self-explanations' effectiveness is discussed. Third, scenarios with sample problems demonstrating the utility of Siegler's learner generated self-explanations for the academic performance of at-risk college students are provided. Fourth, implications for developmental education instructors at the college level are discussed.

EVIDENCE FOR THE SIGNIFICANCE OF SELF-EXPLANATIONS

Self-explanations, according to Siegler (2002), may be described as inferences that we make relative to causal connections that exist amongst objects or events. These inferences we indulge in, furthermore, have immense applications in real life (e.g., how procedures' causes are related to their effects, how systems' structural features impact their functioning, how our reasoning and conclusions are related, or how characters' motivations within a narrative affect their behavior).

THREE TYPES OF EVIDENCE SUPPORTING SELF-EXPLANATIONS

Siegler (2002) and his colleagues focus on three major types of evidence suggesting that self-explanations play a vital role in educational contexts.

Causal connections and problematic math and science instruction. Although learners, ranging from very young children to adults, are capable of generating causal connections, they frequently fail to execute them, even though they are capable of doing so. According to Van Lehn (1983), these occurrences reflect learners' failures of self-explanation.

Individual differences in learning. Gauging the extent to which learners attempt to explain their learning experiences reflects a critical difference between capable and less capable learners. According to Chi, Bassok, Lewis, Reimann, and Glaser (1989), students

are able to learn textbook material across a wide range of disciplines more successfully when they are able to logically explain statements read in textbooks.

Math teaching practices in Japan. According to Stigler and Hiebert (1999), Japanese students' levels of learning in math are consistently higher than those of American students because Japanese educators invest more time and energy providing students with explanations, as well as encouraging students to provide their own explanations, stating why mathematical algorithms produce sought after results.

WHAT DOES RESEARCH HAVE TO SAY REGARDING THE EFFECTIVENESS OF SELF-EXPLANATIONS?

Siegler (2002) and his colleagues were cognizant of the correlation between degree of learning and amount of self explanation; however, only randomized experiments (Siegler, 1995) in which subjects were assigned to conditions encouraging them, or not encouraging them, to utilize self-explanations could establish a link between the two. Hence, subjects in this experiment, who were assigned to a condition encouraging self-explanation, focused on a specific form of self-explanation that required them to explain another person's reasoning. More specifically, subjects were provided with a problem, asked to generate an answer, furnished with feedback that focused on the correct answer, and asked how they thought the experimenter knew that the procedure was correct. This instructional technique has distinct advantages: it is versatile because it can be applied to virtually any task or range of age groups, and it can be easily executed.

Six Critical Issues Regarding the Effectiveness of Self-Explanations

These investigations (Siegler, 1995, 2002) focused on six critical questions regarding the effectiveness of self-explanations, the results of which are summarized below.

Is there both a correlational and a causal relationship between self-explanations and learning? Students in Siegler (1995) and his

colleagues' study were assigned to one of three training procedures (feedback-only condition, explain-own-reasoning condition, and explain-correct-reasoning condition), in addressing this issue by using number conservation problems that closely resembled Piaget's classic procedure. The results clearly indicated that the third condition, having students explain the reasoning underpinning the experimenter's answer, was significantly better than providing them with feedback alone or having them explain their own reasoning. This study revealed that students' learning excelled in the third group because of the variability of their thinking prior to the training exercises. According to Chi, de Leeuw, Chiu, and LaVancher (1994) and Bielaczyc, Pirolli, and Brown (1995), motivating children and adults to explain the reasoning typically encountered while reading textbooks bears similar benefits.

Does encouragement to generate explanations benefit both young children and older individuals? Siegler's (1995) findings demonstrated in the affirmative that encouraging one to explain someone else's reasoning benefits five-year-olds, older children, and adults.

Does one derive greater benefits from explaining other peoples' reasoning or from explaining one's own reasoning? Siegler's (1995) findings also demonstrated in the affirmative that learners in varying age groups who are encouraged to explain someone else's correct reasoning derive greater benefits than learners who are asked to explain their own reasoning which may be correct or incorrect.

Our ability to benefit from self-explanations is influenced by what individual difference variables? Siegler's (1995) study also provided an answer to the fourth question: Students' variability of initial reasoning was positively related to individual differences in learning styles.

Do learners derive greater benefits by explaining correct and incorrect reasoning than by explaining only correct reasoning? In order to test this fifth question, Siegler, (2002) employed a task designed by Perry, Church, and Goldin-Meadow (1988) to test students' grasp of mathematical equality. The task itself entailed problems of the form A + B + C = _____ + C and was selected because the problems

could be solved by using various types of strategies (e.g., 3 + 4 + 5 = _____ + 5 may have been solved with "12" as the answer or with "17" as the answer. The former strategy is called an add-to-equal-sign strategy, and the latter answer is called an add-all-numbers strategy.) The students, in this study, received one of three training conditions: explain-own-reasoning condition, explain-correct-reasoning condition, and explain-correct-and-incorrect-reasoning condition. Results confirmed that subjects in the "explain-correct-and-incorrect-reasoning condition" significantly outperformed all other subjects because they spent less time switching over to new, more advanced reliable strategies while relinquishing old, less reliable ones. These advantageous results enabled subjects to acquire a deeper understanding of the problems and to successfully transfer this performance throughout the posttest phase.

How does encouraging learners to self-explain produce its effects? In responding to the sixth question, Siegler (2002) asserted that at least four distinct mechanisms enable self-explanations to generate their effects. Increasing the probability that a learner will even search for an explanation or that a learner will be encouraged to attempt an explanation of observed outcomes is one way that encouraging self-explanation generates its effects. Increasing the depth of learners' search for an explanation or the depth of their explanatory endeavors is a second way to accomplish the same ends. Changing learners' access to both effective and ineffective ways of thinking is a third likely mechanism. In essence, instructional techniques that strengthen efficient approaches and simultaneously weaken inefficient ones increase the probability that learners will retrieve efficient techniques and decrease the probability that they will retrieve inefficient techniques. The fourth mechanism entails three general processes associated with the degree of task engagement. One process involves motivational effects because learning that makes sense tends also to be more enjoyable. A second process revolves around depth of processing: learners who are encouraged to self-explain process information more deeply than if self-explanation were not involved. Increased time spent actively thinking about the task

constitutes the third benefit. Learning, in other words, is likely to be more successful if learners engage in more time seeking to grasp why correct answers are correct and why incorrect answers are incorrect.

SCENARIOS WITH SAMPLE PROBLEMS

In this section, four scenarios with sample problems are employed to explain and demonstrate the utility of self-explanations. More specifically, two sample problems (one correctly solved and one incorrectly solved) will be applied to each of two core content areas (math and English) to explain and demonstrate the utility of this approach. In the first math example to be presented, the instructor walks up to the blackboard and writes the correct solution to an exponential problem: 10^2 x 10^3 = 10^5, and the following conversation takes place. Instructor: "Why is the answer to this problem a correct solution?" Student: "Well, as I remember, when you multiply any two numbers that have an exponent, the first thing is to be sure that the two numbers that have an exponent must also have the same base. In the example we are looking at, both numbers have base ten, which makes it easy to work with." Instructor: "What else can you tell me?" Student: "Since both numbers do have the same base in your example, I leave that alone and simply add both exponents." Instructor: "Do you remember the general form that we discussed in class to help us remember how to solve this type of problem?" Student: "I believe that when you choose to multiply two numbers that have the same base, you let n^y be one of your numbers with 'y' as its exponent, and you let n^z be your other number with 'z' as its exponent. Then you put it together like this: n^y x n^z = n^{y+z} Since both numbers have the same base, when you multiply them together, you keep the same base (n), and then you are now able to add both of the exponents (y and z) together." Instructor: "That's pretty good. So how would you rewrite my sample problem above?" Student: "I would rewrite your sample problem like this: 10^2 x 10^3 = 10^{2+3} = 10^5." Instructor: "That was excellent. In the past, what did you do that caused you to get the wrong an-

swer to this type of problem?" Student: "Well, in the past, I would remember to make sure that each number with an exponent had the same base, and then I would set up the problem as follows: 10^2 x 10^3 = $10^{2 \times 3}$ = 10^6 My biggest mistake was that I thought that I had to multiply both of the exponents because this type of problem involved multiplication. At that time, this made a lot of sense to me."

At this point, it might be advantageous for the instructor to check for transfer of learning by posing a different exponential problem that, nonetheless, shares some similarities with the original problem. For example, the instructor might write out the correct solution to the following exponential problem: $(X^2)^6 = X^{12}$ and conduct the following conversation. Instructor: "Why is the solution to this exponential problem correct?" Student: "Hmmmm. This is somewhat of a different type of problem to me." Instructor: "O.K. Can you tell me how this new problem is like the preceding problem?" Student: "Well, each problem has exponents, and I guess that each problem also uses multiplication." Instructor: "Good. Now can you tell me how each problem is different?" Student: "In the first example, since both numbers already had the same base, all I had to do was add both of the exponents. But, the second problem is different because there is a number that has an exponent, but this same exponent itself is then raised to a power, too." Instructor: "So, would you simply add both exponents in the second example?" Student: "I feel like adding both exponents, but if I did, my answer would be X^8 which is wrong because your answer is X^{12}." Instructor: "So what do you think is happening here in the second example?" Student: "Well, the only way that I am going to get X^{12} is by multiplying 2 x 6." Instructor: "So what can you tell me about this type of problem?" Student: "I suppose that when a number with an exponent is included inside parentheses, and everything inside those parentheses also is raised to an exponent, that you have to multiply both exponents in this type of a problem. In other words, you don't simply add both numbers." Instructor: "So what do you have to do to get the right answer?" Student: "I

had to multiply both exponents to get the right answer: 2 x 6 = 12."
Instructor: "That's right."

In the second math example, the instructor provides an incorrect solution to the following logarithmic problem by stating that the exponential function $4^3 = 64$ may be expressed as the following logarithmic function: $\log_3 (64) = 4$. The following conversation occurs. Instructor: "Why is this solution incorrect?" Student: "You told us that problems that have exponents in them and problems that have logarithms in them have a lot in common." Instructor: "Can you be more specific?" Student: "Each type of problem is kind of like the opposite of each other."

Instructor: "O.K. What does that mean?" Student: "Well, for example, if I have the following equation that has an exponent in it, like say $y = a^x$, then I can say that this equation's   exponent x $= \log_a(y)$, which is the same thing as saying log to base 'a' of 'y'". Instructor: "And what does that mean?" Student: "In other words, $\log_a(y)$ is the exponent I must raise 'a' (my base) to so that I can come out with 'y.' Now this means, I think, that if $\log_a(y)=x$, then 'x' is the exponent that I must raise 'a' to so that I come out with 'y.'" Instructor: "Correct. And that is the same thing as saying what?" Student: "It means, I guess, that this is the same thing as saying that $a^x=y$. "   Instructor: "So how would you correctly express my equation that has an exponent as an equation in logarithmic form?" Student: "I would say that your equation with an exponent in it, $4^3 = 64$ can be written as the following equation that deals with logarithms, $\log_4 (64) = 3$." Instructor: "Good. Why?" Student: "Because I know that $4^3=64$." Instructor: "So why was my solution to this problem wrong? What was I doing wrong?" Student: "If I say that $\log_3(64)=4$, what I'm really saying is that $3^4=64$, which is wrong because $3^4=81$." Instructor: "Good."

At this time, it may be appropriate to check for transfer of learning by posing another logarithmic problem that shares some features with the first sample logarithmic problem. For example, the instructor provides an incorrect solution to the following logarithmic problem by stating that the exponential function $2^6=64$

may be expressed as the following logarithmic function: $\log_6 64 = 2$. From here, the following conversation takes place. Instructor: "In telling me why the solution to this logarithmic problem is incorrect, please tell me first what this sample problem has in common with the previous sample problem?" Student: "This second sample problem also has the value 64 as a part of the equation to start with." Instructor: "O.K. Now tell me how they differ." Student: "I think what you mean is that this second sample problem has 2 for its base instead of 4, and the exponent here is 6, not 3." Instructor: "So, what do you do from here?" Student: "If I am to do a good job, I need to rewrite the equation that has an exponent, $2^6 = 64$, into an equation that has a logarithm in it, $\log_2 64 = 6$." Instructor: "How do you know that this is correct?" Student: "Because $2^6 = 64$." Instructor: "Correct."

In English grammar, periods and commas are to be placed inside closing quotation marks, and colons and semicolons are to be placed outside closing quotation marks. However, question marks and exclamation marks may be placed inside or outside closing quotation marks. Actually, both question marks and exclamation marks are to be placed inside closing quotation marks only if they actually are a part of the passage being quoted. Otherwise, question marks and exclamation marks must remain outside of the quotation marks. Due to their dual roles, the following scenarios will focus on question marks and exclamation marks being used in quotations. Hence, in the first English grammar problem, a question mark that is part of the passage being quoted is correctly used by being placed inside the quotation marks: Nancy asked Mrs. Smith, "Is it still raining?" The following conversation occurs. Instructor: "Why must this question mark be placed inside the quotation marks?" Student: "In your sample sentence, Mary is the one who actually asks Mrs. Smith if it was still raining. That tells me that her question is actually a part of the passage that is being quoted. So that's why the question mark must be placed inside the quotation marks." Instructor: "That is correct." Note: The instructor decides to check for transfer of learning by provid-

ing the student with an example of the correct usage of an exclamation mark inside quotation marks: The soldier shouted, "Halt or I'll shoot!" (The example with the proper use of exclamation marks inside quotation marks is employed because both exclamation marks and question marks must be used inside quotation marks only when they are part of the quoted passage.) Another conversation occurs. Instructor: "Now, can you tell me why the exclamation mark is used correctly in this sentence?" Student: "In this sentence, the soldier actually tells someone to halt or the soldier will shoot. That tells me that the soldier's strong way of saying what he had to say is actually a part of the passage that is being quoted. So that's why the the exclamation mark must be placed inside the quotation marks." Instructor: "Good."

In the second English grammar problem, the focus is on the use of question marks and exclamation marks when they are not a part of the quoted passage. Here the instructor provides the student with a sentence that incorrectly places a question mark inside quotation marks, when it should have been placed outside the quotation marks: Did I just hear you say, "Food is expensive?" Another conversation follows. Instructor: "Why is this sentence incorrect?" Student: "Hmmm. I noticed that in this sample sentence that the subject of the sentence is not the one who is actually talking about food. Actually, someone else is talking about food." Instructor: "Very good. What else can you tell me?" Student: "Well, I guess that since the subject is not the person talking about food, that the question mark needs be placed outside the quoted material because the question mark is not part of the passage that is being quoted." Instructor: "How, then, would you rewrite this sentence?" Student: "I guess that I would write it this way: Did I just hear you say, 'Food is expensive'?" Instructor: "Good analysis." Note: The instructor decides to check for transfer of learning by providing an example with an incorrect usage of an exclamation mark outside quotation marks: Stop saying "no!" (The example with the improper use of exclamation marks outside quotation marks is employed because both exclamation marks and question marks must be used outside

quotation marks when they are not part of the quoted passage.) The following conversation takes place. Instructor: "Can you tell me why the exclamation mark is used incorrectly in this sentence?" Student: "This one is tricky." Instructor: "Why?" Student: "Well, in all of the other sentences, you knew from the beginning who was the subject of the sentence and who said what." Instructor: "Go on." Student: "I guess someone is saying no over and over. But that person is not the subject of this sentence because someone is tired of hearing the person who uses the word yes again and again." Instructor: "And therefore." Student: "Just like in the preceding sample sentence, since the subject is not saying yes over and over, then I guess you would have to place the exclamation mark outside the quotation marks because the exclamation mark is not part of the quoted passage." Instructor: "So how would you rewrite this sentence?" Student: "As follows: Stop saying 'no'!" Instructor: "Job well done."

From the aforementioned scenarios with sample problems, students demonstrated a breadth of understanding that enabled them to more deeply process information and to successfully transfer their performance to other sample problems within the same discipline. All of this was possible because they explained why someone else's correct solutions to problems were correct and why someone else's incorrect solutions to problems were incorrect. In essence, these instructional/pedagogical approaches strengthen the students' efficient approaches and simultaneously weaken inefficient ones, which in turn increase the probability that learners will retrieve efficient techniques and decrease the probability that they will retrieve inefficient techniques.

Implications

At-risk students, underprepared and/or nontraditional, enrolled in college level courses must confront and conquer a variety of challenges—both academic and nonacademic—if they are to have a decent opportunity to succeed in academia. Based on Siegler's (1995, 2002) studies, the education community has at its disposal a powerful approach for helping these students meet these academic

challenges: self-explanations. This approach succeeds because it centers on the need to design pedagogical procedures that are instructionally effective.

Hence, for instructors of developmental courses, the previously mentioned approach specifically implies that it should provide students with problems that are correctly solved as well as problems that are incorrectly solved. Then the students should be asked to explain why the approaches employed to solve the correctly solved problems are indeed correct and why the approaches selected to solve the incorrectly solved problems are inappropriate. Application of these pedagogical approaches are significantly effective because they increase the degree to which at-risk college students understand what they read or write by enhancing their ability to logically explain textbook information.

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Technologies that Capitalize on Study Skills with Learning Style Strengths

Dusti D. Howell

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This article addresses the tools available in the rapidly changing digital learning environment and offers a variety of approaches for how they can assist students with visual, auditory, or kinesthetic learning strengths. Teachers can use visual, auditory, and kinesthetic assessment tests to identify learning preferences and then recommend students use technological tools that match those strengths. To assist in this process, new software- and hardware-based digital study tools will be profiled and categorized as visual, auditory, and kinesthetic resources. It is hoped that this will help generate new thoughts and approaches for educators and learners.

Focus on Strengths not Just Weaknesses

How many students today graduate from college knowing, using, and celebrating at least one of their learning strengths? Today, when students struggle in learning, schools focus primarily on assessing, identifying, and developing a profile built around learning weaknesses. Labeling students, however, with a title that identifies their learning deficiencies is necessary to identify academic interventions.

The best-case scenario is that early attention to the learning problem will eventually allow students to shed the label. However, if the problem is not fixed early, students may carry these labels throughout their school years and even beyond. If these labels are a life sentence, perhaps it should be mandated that before any student is labeled with a weakness, he or she must be first labeled with a strength. The idea is to get students and their teachers to focus first on student strengths, before addressing weaknesses. In fact, teaching a student through his or her strengths should be the first intervention considered for remediation of weaknesses.

If we look closely enough, some disability weaknesses have a strength embedded in them. An interesting example of this can be applied to students that are labeled with ADD (Attention Deficit Disorder). Psychologist George Dorry, executive director of Denver's Attention and Behavior Center (as cited in Freed & Parsons, 1998), states that ADD learners have strengths in a number of areas. He states that they are right-brained, visual learners that process information randomly. Additionally they are creative, can do difficult math problems in their heads, and are excellent speed-readers. Unfortunately, Dorry observes that these strengths rarely stand out and these students struggle in school because educators tend to be left-brained, detail-oriented, auditory processors who view visual learners as flawed. What would happen if educators began helping ADD students by first focusing on their strengths?

Clifton and Nelson (1992) highlight the idea of focusing on strengths in order to overcome weaknesses through the story of the Chinese table tennis team that won the gold medal during the 1984 Olympics. A reporter asked them how they were able to win the Olympic title and to continue to dominate the sport. During the interview, the team indicated that the secret to their success was that they spent eight hours a day perfecting their strengths, which overwhelmed their weaknesses. They pointed out that while their best player had an extremely weak backhand, his forehand was so fantastic he could not be beaten.

Assessing Visual, Auditory, and Kinesthetic Strengths

One of the easiest ways to assess learning style strengths is to begin with sensory modalities. These modalities have to do with our five senses: sight, hearing, touch, smell, and taste. These are our major sources for obtaining information. Although there are five senses, the senses of smell and taste are generally overlooked in the learning process. In most schools, the primary learning senses are visual, auditory, and kinesthetic.

Visual learners are those who tend to learn and recall information best when it is presented visually. Auditory learners are those that learn best by using the sense of hearing. Kinesthet-

ic learners are those that learn best by using the sense of touch. They may learn best through the hands-on haptic sense in which they are actually touching or manipulating material with their hands. They may also learn best by being actively involved in their learning. This process of learning while in motion is more accurately classified as kinesthetic (Howell, 2005). For the purpose of this article, both haptic and sense of motion are classified as kinesthetic.

   To make the sensory modalities come alive in the classroom, instructors should employ the following four-step process:

1. Instructors should first identify their own learning modalities. There are numerous online modality assessments that are automatically scored and can quickly identify one's modality strengths. A link to a review of a dozen sensory assessments is given at the end of this article in the resources section.

   a. Since the test-retest reliability of most sensory modality instruments is often suspect, it is recommended that more than one test be taken.

   b. A more accurate categorization of learning modalities is to identify both the primary and secondary sensory preferences. Six sensory learning strength profiles emerge: visual-auditory, visual-kinesthetic, auditory-visual, auditory-kinesthetic, kinesthetic- auditory, and kinesthetic-visual (Markova, 1996).

2. After identifying their own learning strengths, teachers need to take time to reflect on how their learning preferences impact their teaching. For example, a teacher with a primary auditory preference might rely on lectures. An auditory teacher might consider how his or her own learning preferences and consequent teaching styles affect students with visual or kinesthetic preferences.

3. At the beginning of a course, teachers should ask students to identify their learning strengths by taking an online sensory modality test. Upon receiving their results, students would write a couple of paragraphs indicating how they will apply their sensory strengths to study for this course.

4. A class brainstorming session would allow students to share and identify tools and strategies that are useful for each of the sensory

strengths. Students will gain new ideas about how to study from this session. Teachers will also gain insight into the learning preferences of their students.

USING TECHNOLOGIES THAT CAPITALIZE ON LEARNING STRENGTHS

Technology is a resource that allows students with disabilities to catch up to their peers. From laser surgery to hearing aids to prosthetics and electric wheelchairs, technology has helped provide a more level playing field for those with sensory weaknesses. What if technology could be viewed instead as the great enhancer? In this case, technologies that allow students to capitalize on their strengths are recommended. What follows are a number of technologies that educators and students may find beneficial in the learning process for each of the sensory modalities.

Visual Resources

Visual Search Engines. As an instructor, I encourage visual learners to use search engines that organize information visually. This is especially true when introducing a new topic. Search engines such as Grokker, KartOO, Webbrain (PC only), and Girafa, a visual outline of how the topic is categorized. This is incredibly useful in helping visual learners be more specific with their search terms before using a more accurate engine like Google to finish a search.

Visual Thesaurus. Visual Thesaurus (http://www.visualthesaurus. com) has over 145,000 English words visually mapped. Find exactly the right word with this tool that combines definitions and synonyms in a visual format that is both intuitive and customizable. On the visual map that appears, the closer a word is to the target word, the more strongly they are related in meaning. Controls for nouns, adjectives, verbs, and adverbs on the right of the screen allow for more detailed results. For students that overuse the word *cool*, have them type this into the visual thesaurus and challenge them to choose more suitable replacements.

Reading. Acereader (http://www.acereader.com) is an award winning software package developed to increase reading speed and retention. The program accomplishes this by teaching you to control the

focus and positioning of your eyes while removing the opportunity to subvocalize words in your mind as you read. Built-in tutorials help visual learners improve the speed of their eye fixations (picking up words faster) and increasing the breadth of their eye span (reading more words in each fixation). Users can choose to see the text one word or phrase at a time, in a font style, size, color, and background color of their choice. The result is that it pushes users to read faster. It is amazing how much it increases comprehension as it forces the user to focus more intently on the words as they flash on and off the screen.

Auditory Resources

Books. For students who are auditory learners, there are many audio books available. A leader in this area is *Audible* (http://www. audible.com) which provides users with the resources to listen to books on mp3 players.

Pronunciations. Merriam-Webster Dictionary (http://www.m-w. com) is an exemplary online resource that allows users to listen to the pronunciations of most words. In the case of words that have more than one accepted pronunciation (e.g., piranha), more than one pronunciation is given.

Voice Recognition Software. Voice Recognition programs do a fantastic job of converting speech to type. *Dragon Naturally Speaking* is an easy to use speech recognition software can be set up in as little as five minutes with accuracy increasing up to 99%. *Dragon* is compatible with virtually all Windows software and will navigate between the web and your computer with simple voice commands. (PC only). Macintosh users will want to try *ViaVoice,* which is IBM's speech recognition software. Like *Dragon, ViaVoice* also allows you to dictate, edit, navigate, and surf the internet with your voice.

Audio Recorder. Students may record class lectures for review later. Attaching a microphone accessory to an iPod can also allow students to record class lectures.

Kinesthetic Resources

Digital Note-taking. Smart Pen by Anoto. This digital pen is a powerful digital computer that fits into the palm of a hand. It con-

verts written words and drawn images into a format that is downloaded to a computer when the pen is returned to its cradle. For best results, use the pen with an ink cartridge on the special digital paper to create both a paper copy and a digital copy of your writings and drawings (http://www.destinyplc.co.uk/flash/#/home/intro/).

OneNote. An application which is designed to assist student note taking and research by integrating multiple file formats (audio, video, text, images) into one program. *OneNote* is designed to improve the organization capabilities of a computer by incorporating functions like note flags, timestamps, scope searches, and resizable page tabs. To get the most from this software, it is recommended that it be used on the new tablet style PCs which allow you to take notes with a stylus right on the screen, just as if you were taking notes on a piece of paper. Microsoft's optical character recognition software then translates the handwriting into text. (PC only) (http://office.microsoft.com/en-us/FX010858031033.aspx)

Audio Recorder. Kinesthetic learners should record and listen to these lectures later under more active conditions such as walking or moving around in their room.

Visual, Auditory, and Kinesthetic Resources

Some resources are good for more than one type of learner because they provide benefits for more than one modality.

Podcasts. The most common types of Podcasts available are audio and video Podcasts. Audio Podcasts are MP3 audio files that can be played on a MP3 player like an iPod or on a computer using iTunes. Kinesthetic learners can benefit by listening to audio lectures while in motion. Video Podcasts can benefit both auditory and visual learners and can be played on a video iPod or in iTunes. The easiest way to make a Podcast for a class is to create a video file in *Windows Movie Maker* (PC) or *iMovie* (Mac). Upload the finished *Windows Media* (.wmv) or *QuickTime* (.mov) files for free to http://Podomatic.com. Those new to podcasts will first want to go to iTunes and select the Podcasts option on the left side of the screen which can be viewed at no cost.

Smartboards (*aka Electronic Whiteboards*). Smartboards com-

bine the flexibility of a whiteboard with the power of a computer. An LCD projector is first used to project the computer screen onto the smartboard. The smartboard converts the computer screen into a touch screen. It is as if you had a 100" touch screen monitor in front of the classroom. Touch the projected image with your finger, just as if you had clicked it with your mouse. Quickly double tap on anything on the screen, and the computer reacts just as if you double clicked it with the mouse. Visual and auditory demonstrations can be made by both teachers and students. Kinesthetic students can be asked to go to the smartboard and give a hands-on demonstration.

Some schools don't have the funds available for smartboards that can cost $3000 or more. Johnny Lee at Carnegie Mellon University found a way to use a *WiiMote*, the remote control device for Nintendo's *Wii*, to create a $100 smartboard.

Conclusion

Focusing on strengths is the way most world-class athletes and musicians become highly productive. However, unless you are one of the few autistic savants with a highly refined talent, most labeled students are expected to spend the majority of the day working on those weaknesses. It is difficult to stay excited and productive in this type of environment. What if world-class athletes and musicians were required to wear a label that identified their top weakness, and then spent the majority of the day working on that weakness? How productive and positive would they be?

From a corporate perspective, Marcus Buckingham and Donald Clifton (2001) wrote a book called *Now, Discover Your Strengths* in which they brilliantly showcase to corporations the idea of focusing on each individual's strengths at every level of a company. Their research was culled from over two million open-ended surveys with leaders and highly talented individuals in a wide variety of fields. An analysis of this research revealed thirty-four specific strengths. The *StrengthsFinder* assessment was developed to identify the top five strengths each individual has from this pool of 34 possible strengths. No scores are given as a result of taking this assessment. Instead, each

individual receives an ordered listing of his or her top five strengths. Research has shown that the most successful individuals in any endeavor are those that focus on their top strengths (Buckingham & Clifton, 2001).

If this idea of focusing on strengths works for world-class athletes, musicians, and businesses, it should also work in the world of education. The Internet is literally exploding with new resources that can help students succeed in an even bigger way if they choose to use those technological tools that best match their strengths. By empowering your students to study with their strengths in mind, you will not only be reaching more students in your classes today, but you will be empowering them to succeed for the rest of their lives.

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Sleep is Overrated: The Developmental Education Innovative Research Imperative

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Developmental education sits at the nexus of all things educational, yet developmental education research seems asleep, unaware of the valuable and critical perspectives the field can provide. In that light, this article address-es the developmental education identity crisis addressed by Arendale (2005) in "Terms of Endearment," suggesting principles for a new wave of developmental education research. These principles suggest an innovative re-search imperative that includes the explora-tion of new learning contexts with new theo-retical perspectives and analysis techniques. A new commitment to innovative research ideas should help revive research in the field and help students reach their educational goals.

Despite an array of published approaches and outcomes for de-velopmental education, little has changed about developmental education practice since the 1970s, with two notable exceptions being the use of the computer and supplemental instruction. Es-sentially, developmental education programs assess learning defi-cits, and then try to repair them. For me, listening to the research of far too many reports at developmental education conferences is much like "Rockin' to the Oldies," same old tunes, re-mastered, re-mixed, and re-reported, one more time. Even the central term of the field, "developmental education," has an ambiguous, haze about it. Too often people outside the field confuse it with human development, particularly child development and even special edu-cation (Maxwell, 1997).

In fact, the terms we use confuse matters more. For instance, the field has been unable to shake the use of the verbal "to remediate."

Remediation is an identity defining characteristic, meaning to correct something that is bad or deficient. Remediation is hard, fast, and rather exact, not necessarily designed to bring hope and pride to policy-makers. More broadly defined is developmental education, a sophisticated concept rooted in cognitive and developmental psychology (Boylan, 1995). It includes personal autonomy, self-confidence, study behaviors, and social competence as factors that affect performance, along with academic preparedness (Boylan, 1995). Whether correcting a deficit or maximizing student potential, the field seems bound by the warring terms meant to describe, identify, and promote it.

While little has changed about developmental education practice, what we have learned about motivation and culture in the last 30 years is much improved over the previous 100 years. Much of this new knowledge comes from thinking and research that combines fields, like what is found now found in the new field of cultural psychology or the mixing of medical research and educational psychology to inform the study of adolescent motivation and achievement. One example is the series of sleep studies that suggested that adolescents needed more sleep than previously thought and needed to sleep later, causing many high schools to start school later in the day (Carskadon, 1999). These conclusions were based on the discovery of teenage sleep patterns governed by unique adolescent circadian rhythms. High school students who slept later learned more. Openness to presenting, examining, and encouraging syntheses of theoretical and research ideas across fields resulted in this type of finding.

In a similar fashion, developmental education research must reach beyond the current status, while still remaining accessible to practitioners. Examples of new research include the relationship between developmental education and numerous external outcomes like labor health and community factors. Examples of internal aspects of students' thinking include the examination of the relationship between social belief systems (including those of the developmental education practitioner) and students' perceived

control over their own academic performance. The unique place of developmental education in all of education provides countless perspectives for research that informs all of education and many other human endeavors.

RETHINKING DEVELOPMENTAL EDUCATION RESEARCH

We need to rethink developmental education research with a focus on innovation. Why is it necessary that developmental education begin when a student applies to college and end when a student is ready for college-level study? If the past is the problem, where is the heavy influence of developmental education research on elementary and secondary school practice? What are the roles of developmental educators in these same schools? What happens to developmental education students when they leave these programs; in fact, what are their life trajectories after developmental education? What are the developmental needs of students who are not in college? Are they the same as those who attempt college? Is there a need for developmental support for training programs in the business world, in government, in the health sciences, and in the military? In other words, are the theories that drive what developmental education programs do dependent only on the postsecondary context or can they be transferred to other contexts, like continuing education programs for physicians or prison guards? Can we ever have enough studies of the impact of culture on learning in developmental education? Also, and not entirely facetiously, do developmental education students need more sleep?

With the blending of new ideas as a focus, this paper suggests a new language, in fact, a set of new research cultural values, that could improve what developmental educators do and how policymakers understand students who may not be ready for postsecondary study (Arendale, 2005). Furthermore, public schools are in the midst of tectonic shifts that will affect the practice of developmental education. For example, one shift is the growing Early College High School movement. More and more high schools are teaming with community colleges so their students can leave high

school with both a diploma and an associate's degree. In order to make the dual degree a reality, developmental education courses are being taught to high school sophomores and juniors, and developmental education researchers need to be there. This also means that serious preparation for college study needs to begin in the 7th and 8th grades, and developmental education researchers need to be there too. In another example, No Child Left Behind legislation will almost certainly be radically changed or dismissed soon, leaving a curriculum articulation vacuum and possible even wider differences in student readiness for college study. With little doubt, policy makers will call upon developmental education to close the educational cracks that appear.

Arendale (2005) argues for the transformation of developmental education, including development of a new language, partnerships, objectives, and programs. In particular, he suggests a language that supports a holistic view of the students. To that end, I suggest the commencement of a set of ideas designed to advance research in the field, called the Developmental Education Innovative Research Imperative. This imperative rests upon a foundation of a new set of fundamental research values that combine knowledge and beliefs about how to improve research in the field. Additionally, these values dictate that developmental education research must assume a much more central role in educational research. Developmental education is at the nexus of several fields of study—such as adult education and adolescent development, cognition and instructional design (for adults and adolescents), motivation and policy, secondary and postsecondary, and numerous other combinations.

FUNDAMENTAL VALUES FOR THE DEVELOPMENTAL EDUCATION INNOVATIVE RESEARCH IMPERATIVE

Undergirding this new approach are several fundamental values. First, developmental education researchers must avoid insularity in what they research. In fact, they should challenge widely held assumptions about developmental education, particularly those held by developmental education researchers and practitio-

ners. Therefore, as the research becomes more inventive, so must a tradition of critique expand. Second, students at risk of failure (like all students) are embedded in multiple systems, both internal and external. Development, then, is the study of what happens inside students and what is going on in their environments (Goldstein & Brooks, 2005). That is, the problems that developmental students face are more complex than learning deficits. Therefore, it is incumbent upon developmental education research to embrace more fully human, student, and adult development.

Third, developmental education researchers must more fully capture the complexity of the situation with their research designs and analysis techniques. New theories suggest that human interaction and cognition exist on multiple levels, enriching the notion of the whole student. As the theoretical perspectives become enriched, so will the research designs and the statistical or other analytical tools needed to examine or test the theories. For example, cross-institutional and multilevel modeling approaches must become the new norm for quantitative research. Also, the rigor of meta-synthesis should compel better usability of qualitative research findings.

Fourth, instructional interventions must grow directly from this research. As the problems studied become more complex, the interventions will more than likely increase in complexity and power. Both developmental education researchers and practitioners must come to terms with this complexity. Therefore, the widespread training and certification of instructors is critical. Fifth, understanding and researching poor practice is just as important as understanding and researching best practice. In fact, while becoming more wary of the phrase best practice in its literature, the field should increase interest and emphasis on meta-analysis and meta-synthesis.

The study of developmental education should be just as multilayered, dynamic, aware of, and interested in the complex nature of developmental education students as these innovative research values require. One example of a set of theories that reflect the above research values comes from the intersection of social psychology and human development. Developmental education

researchers rarely use these theories, and they may bring more explanatory power and new interventions that will serve a greater diversity of students.

EXAMPLE: SOCIAL PSYCHOLOGICAL THEORIES BRING MORE EXPLANATORY POWER

The theories that have dominated postsecondary study (e.g., Bean, 1985; Tinto, 1988) appear to explain immediate causes for student performance and persistence. Studies using these frameworks tend to focus on immediate issues like poor institutional fit, heavy student workload, or financial troubles. However, self-efficacy theories may suggest root causes of postsecondary performance, providing deeper insights and more explanatory power of context and behavior. Self-efficacy beliefs are people's judgments of their capabilities to perform tasks. Bandura (1993) extends this concept to say that people's level of motivation to achieve is based more on what they believe, rather than what is objectively true. Therefore, the beliefs that people have about their capabilities may be better predictors of performance than actual competence. Critically important here is that one key function of developmental education is to focus students' attention on what is objectively true, the learning deficit, a practice that theoretically could actually decrease motivation to perform as desired.

Of course, no amount of self-appreciation can overcome an actual lack of requisite knowledge and skill. This is particularly true for traditional developmental education students, who lack reading, writing, and mathematics knowledge and skills, at a minimum. But as Bandura's theories suggest, developmental education students are more complex than just learning deficits.

When it comes to students who need learning assistance, Borkowski and Thorpe (1994) suggest a breakdown in the integration of self-regulation and motivation aides in underachievement. However, studies of self-efficacy in developmental education students present a puzzle: developmental education students tend to have self-efficacy beliefs similar to those of college students

who have much higher skill levels (Young & Ley, 2001). Students needing remediation at college entry may not know that they lack particular skills and will be unaware of the strategies and effort needed to acquire the needed skills. Borkowski and Thorpe (1994) identify this disassociation as a block or misinterpretation of feedback received about the causes of successful or unsuccessful performances. Therefore, a characteristic of underachieving students' attribution beliefs is inappropriate beliefs about effort and strategies that improve performance. Borkowski and Thorpe (1994) outline the consequences of an immature attributional belief system as an immature self-regulatory system, leading to less planfulness, more impulsivity, and less persistence for underachievers.

This conception of self-efficacy suggests a rethinking of much of developmental education research. For example, more research is needed on student belief and attitudinal systems, as suggested by Ajzen's Theory of Planned Behavior (1991). According to the theory, behavior (or performance) results from students' intentions that are influenced by attitudes and beliefs about the behavior, what others think about it, and one's actual and perceived control over the behavior. When applied in fields outside of education, the theory has demonstrated high predictive value, and it fits well with the values of the Developmental Education Innovative Research Imperative. Also, resiliency theory (Goldstein & Brooks, 2005) is drawing increasing attention with its focus on student assets as predictors of success, rather than deficits—the current raison d'etre of developmental education. Born in medical research, resiliency theory suggests that risk factors accumulate over long periods of time to produce failure. However, protective factors or assets exist along with risk factors, and enhancing these can multiply the positive effect of any later intervention. The innovative aspect of resiliency approach is that those responsible for the later intervention drive the development and implementation of the earlier protective systems. Such re-thinking will refresh research in the field, ultimately helping developmental education research live up to its great calling and expand its reach.

IMPLICATIONS FOR FUTURE RESEARCH

Based on its vantage point, developmental education can become the center for innovation research and practice in education. Of course, this idea of innovation is incomplete without the research also being effective. To this end, I believe that the innovative research values can be used by leaders in the field and groups like the American Council of Developmental Education Associations (ACDEA) to organize efforts to promote innovative research. This will begin with the testing of new theories using secondary data sets, developing primary research studies designed to test innovations, and providing an innovative method for organizing and disseminating findings.

A blue ribbon commission of ACDEA conducted a strategic analysis of the profession, citing major weaknesses of the profession as lack of support for research, lack of training in program evaluation and research, and limited access to graduate programs (Blue Ribbon Commission, 2006). However, ACDEA could capture the attention of departments of education, coordinating boards, and foundations with a relatively, inexpensive and unique way of disseminating and promoting research. The ACDEA must continue the work it has begun by disseminating and promoting research.

For example, perhaps a website could be funded that links all of the research produced by its participating organizations. Rather than just information and links to papers and other resources, this website would continually store, organize, and calculate the statistics for a running meta-analysis of developmental education research results. Researchers would submit their published and unpublished studies to the site, where others in the field would review and rate the studies. The engine for the website would be a database that could be queried so that any end-user could assess and reanalyze findings based query terms. Next, end-users could query the database to get the actual studies, create new maps of sub-regions regions, examine criteria for evaluating the studies (like effect size), and read peer commentary on the studies.

CONCLUSION

With the above principles as just a start, great interest and funding can be drawn to developmental education, with new ideas tracking the new ascension of developmental education research. The practitioner's role in this is critical: practitioners need to be much less satisfied with developmental education research. They must question, critique, and demand more from research. Since so many developmental education researchers double as practitioners, they should also insist that research methods be accessible, despite their complexity. In fact, the field is overdue for a journal that focuses on research methods and also targets developmental education practitioners. Therefore, developmental education researchers need to shake off our current dormancy, examine our own circadian rhythms, and produce new, transformative research. Indeed, our current sleep is overrated; it is imperative that we wake up to our immense potential.

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Instructor Manuals That Reach Beyond the Basics

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Providing instructor manuals for part-time faculty is not a new practice. Post-secondary institutions often produce manuals filled with everything from the college calendar to the procedure for obtaining a parking pass. However, in the age of stretched budgets and waning support from their institutions, developmental education programs are looking for better ideas to boost their professional development for part-time faculty in low-cost ways. Improving the department's instructors' manuals can do just that.

Survey of Literature

For our purposes, part-time faculty as defined in the NADE Self-Evaluation Guides are "teachers who occupy positions that require less than 50 percent of full-time service and whose appointment includes only limited or no fringe benefits" (Clark-Theyer, 1995, p.171). These professionals may be adjunct faculty hired to teach several classes a semester or full-time employees who teach one or two classes for another department. Most part-time faculty teach on a per-credit basis and have contracts that are renewable each semester, yearly or every two or three years. All of these professionals are subject to not having their contracts renewed if the student population decreases or budgets run low.

The literature concerning part-time faculty documents the lack of experience in their institutions. Benjamin (2003) reports that more than half of the part-time instructors have been in their present institutions less than four years and lack the institutional experience necessary to orient and assist students. Townsend (2003)

found that post-secondary education, which includes a vast number of part-time faculty, "has accommodated itself to a class of teachers who receive… minimal support for teaching, academic research, and professional development" (p. 23).

What are the results of this lack of support for teaching, academic research, and professional development? The research of the AAUP (2003), Benjamin (2002), Eney and Davidson (2006), Jacoby (2006), and Renninger et al. (2007) shows alarming evidence that student learning may be adversely affected. In its report "Contingent Appointments and the Academic Profession," the American Association of University Professors (2003) said, "Contingent faculty, especially part-time faculty, … are less likely to be informed about the latest developments in an academic discipline and to be challenged by recent research and writing" (para. 23).

In developmental education courses, the need for professional development may be even more critical than in the academic disciplines. The students who need to start their college careers with one or more developmental education courses often have been unable to thrive in classrooms with traditional instructional methods and materials (Smittle, 2003). Instructors need to learn a wide variety of teaching methods in order to reach these developmental students. Without professional development opportunities, how can part-time instructors learn these methods?

Gappa and Leslie (1993) were among the first to publish the recommendation to create a faculty manual and distribute it to all department chairs and faculty members, both full- and part-time. They suggested putting in this manual employment policies and giving it to part-time faculty at their faculty orientation. More recently, Nolan, Sieguist, and Richard (2007) suggest including two sections: one that details policies and procedures and another that offers information on the theory of teaching and learning and practical applications to the classroom. This idea is echoed in Lambert and Cox (2007), who developed a guidebook of "teaching suggestions, campus resources, and helpful hints for easing one's arrival to the school"(p. 204). The authors surveyed

both adjunct faculty and department chairs before assembling this guidebook. The result was a document that even instructors who had been teaching for several semesters found extremely helpful.

The advantages of an instructors' manual can be tremendous. A manual can help instructors begin to understand developmental students and adult learners, give ideas for a stimulating class session, aid instructors in dealing with disruptive or absentee students, assist instructors in developing their teaching ability, and provide instructors with a concise listing of the institution's policies and procedures.

Instructor manuals can be organized in several ways. Some departments have produced a three-ring binder or a CD. Both of these allow instructors to pull ideas at will while a three-ring binder also allows instructors to add helpful and updated material to their individual copies of the manual. Online versions also exist, but Lambert and Cox (2007) found that often few of their instructors knew where to find their online manual.

There are two distinct types of instructor manuals: the general department manual and the program specific manual. Both can be invaluable resources for the instructor.

General Department Manual

Many colleges and universities provide faculty/adjunct handbooks that explain institutional policies and procedures as well as other useful information; however, a general manual targeted for a specific department or program can be a great asset to both full-time and adjunct faculty. This is especially true in developmental education where oftentimes part-time instructors have been hired because of their knowledge of content in reading, writing, and math, but they may lack teaching and learning strategies specific to helping developmental students succeed. A well-designed, detailed general department manual provides one type of professional development.

A departmental manual becomes essential for several reasons: to document the program, including mission goals, objectives and strategies; to make program components uniform; to allow a seam-

less transition for future semesters and future directors; to orient and inform new instructors; and to share with college-level math and English faculty to encourage consistent and measurable learning outcomes. The goal is to work closely together across departments to help developmental students successfully transition to college-level courses.

A general department manual is a work in progress and must be updated regularly to keep current with advising and placement, support services, contacts, courses, syllabi, programs, teaching/ learning strategies, articles, and best practices in the field. For this reason, a three-ring binder with dividers to help organize is recommended. Another option would be an electronic version to keep material current. To enhance readability, it helps to use attractive graphics and typography in hard copy and electronic versions.

Because this kind of general department manual is substantial in size, labor-intensive and regularly updated, only one copy is usually provided for a department. The manual should be introduced to each new adjunct or full-time instructor and kept in a central location easily accessible to all. For example, the manual can reside in the department chair's office, the learning assistance center, or online. As new articles are added to the manual, copies can be provided to instructors for their own files. Each instructor should be required to provide a current syllabus to be included in the manual.

A general department manual can become not only a teaching tool and department guidebook but also a living document of the evolution of the department. It works especially well for small, intimate campuses, but it can also be adapted to larger institutions, especially in an electronic version which is accessible to a larger audience.

The manual might include an introduction with departmental rationale. A clearly defined mission statement, goals, objectives, and strategies – based on best practices – should be included and regularly consulted and followed. Charts can be developed to graphically illustrate the sequence of courses as well as placement

cut scores and course descriptions. New courses, programs, and support services (academic counseling, testing center, learning center) and other contacts relevant to the program should be included.

Additionally, it is recommended to include appendices, such as syllabi templates, course templates, educational effectiveness assessment plans, and learning outcomes. These appendices should be updated annually for evaluation and improvement of the department. Other sections might include "campus facts," teaching tips, articles on developmental education and on teaching English Language Learners as well as the National Association for Developmental Education (NADE) Glossary of terms in the field.

Furthermore, the manual can provide faculty and instructors with bibliographies of useful references and best practices in the field. Schedules of current on-campus training opportunities may also be included along with other promotional materials related to developmental studies and learning support.

Clearly, a general department manual is an invaluable resource to the department and to its faculty and instructors – if it is kept current and consulted regularly! For this reason, an online version, which can be accessed 24-7, presents the greatest opportunity for currency of information provided there is someone who can maintain the website or Blackboard account. Such a manual can be central to orienting and training new instructors; it is also valuable as a tool for communication among colleagues who share ideas and a common pedagogy.

Program Specific Manual

In institutions where a college-wide part-time instructors' guide exists or a centralized developmental education department is absent, a program-specific manual is advisable. Such a manual has the advantage of focusing strictly on the teaching of developmental reading, writing, or mathematics and the structure of the developmental program. This provides part-time instructors with information and materials to enhance instructional design and classroom interactions.

Program-specific manuals should cover two broad areas. The first area has to do with the framework within which the developmental discipline is taught. Two key topics come under this notion of framework: theory and context. First, the theoretical foundations behind the curriculum and pedagogy with implications for classroom instructional design are essential to an effective manual. This section on foundations should begin with the institutional mission and vision statements. Then, the section should include learning theory, adult learner development theory, motivational theory, pedagogical approaches for developmental students, and the mission of developmental education. The choice of theories for the manual depends in part on the developmental discipline. For example, a reading program may choose to focus on the cognitivist-constructivist approach to learning and reading and the implications for lesson planning. Unfortunately, practice typically neglects theory because the apparent urgency of preparing for actual classroom teaching looms large. This, however, is a shortsighted practice that is somewhat analogous to our students wanting to solve word problems in math before understanding the concepts upon which the problems were framed.

Second, the program-specific manual should frame the context within which specific developmental courses are offered. This discussion must include larger institutional, department and/or program policies, procedures, and curricula expectations. A developmental writing program manual, for example, should explain the college's assessment and placement policies and cut-scores used to place students in writing classes. Faculty members who do not have a long history at an institution frequently have little idea about the placement process and how students are enrolled into their classes. Having a description of the department's sequence of required composition classes helps a developmental writing instructor see where and how his/her class fits in the larger continuum. A clear statement of the developmental program's mission, its teaching philosophy, and its approach to academically underprepared adult learners should also be part of this framework section. Some pages

can be devoted to delineating course curriculum, expected learning outcomes, and academic assessment procedures. Including, say, a list of writing problems typical of developmental writers at this juncture would be extremely helpful for composition teachers new to developmental education to understand the expected learning outcomes for the program.

The second broad area of a program-specific manual consists of ideas for the practice of teaching within the program's developmental discipline. Ideas included can range from sample syllabi to creative approaches to building community within a classroom to examples of worksheets used to engage students in active learning. Experienced faculty members can be invited to contribute materials that they have used in different classroom settings to actively engage students who have a range of learning style preferences. A developmental reading program may choose to have sections that cover active reading, teaching a novel, summary writing, portfolio assessments, and library assignments. Developmental math manuals may want to include ideas on how to promote effective math study skills and overcome math anxiety, as well as how to balance long-term conceptual understanding with short-term mnemonic "tricks" for test-taking purposes. A developmental writing manual might have sections on teaching grammar to adult learners, instilling writing as a process as opposed to a one-time stream-of-consciousness event, and encouraging a critical level of thinking and expression.

Making the Manual Legal

When producing any kind of an instructors' manual, it is essential that you secure permission to use any copyrighted materials. According to the United States Copyright Office (2006), Copyright protects 'original works of authorship' that are fixed in a tangible form of expression. Since any printed or electronic material fits this definition, it is against the law to reproduce any material of this kind without written permission. Once the permission is secured, it is important to keep a copy of the letter, email, etc., for proof.

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Once the manual is produced, it automatically is copyrighted. If you wish, you may secure an official copyright from the United States Copyright Office, but it is not necessary. Registration information can be obtained from http://www.copyright.gov/circs/circ1.html#rp.

Conclusion

It is important to be sure that your instructors know about the manual and understand how to use it. As faculty members are hired, consider including the manual in the new faculty orientation. In addition, encourage faculty, both full- and part-time, to contribute ideas and hold workshops where they can discuss how they have effectively used these teaching/learning tools in their classrooms. If your institution uses mentors for new faculty, have the experienced faculty focus on the manual's contents as they mentor.

Whether the manual is general or specific in nature, it should be a living, vibrant work that is updated regularly and meets the needs of the department or program. Though a manual will never fulfill the professional development needs of part-time faculty by itself, it will provide a solid foundation on which to build.

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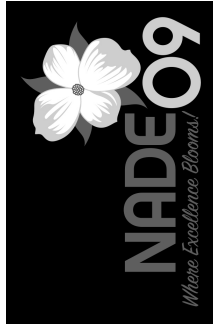
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