

MyAcademicWorkshop in the Technical College Classroom

Results and Observations about Using an Auto- corrected, Algorithmically-generated Homework System

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About the Authors

Link-Systems International, Inc. (LSI) provides online tutoring through the NetTutor® Online Tutoring Service. NetTutor was created in 1996 by mathematics professors at the University of South Florida in Tampa, where LSI is still based.

- David Kephart, Director of Academic Research at LSI, has taught mathematics at the University of South Florida for a decade.
- Spencer Hamrick, mathematics instructor and Learning Support Math Coordinator at Southern Crescent Technical College, has a passion for implementation of technology in the classroom, drawing on his experience as a former mechanical design engineer at a Fortune 100 company.

MyAcademicWorkshop in the Technical College Classroom: Results and Observations about Using an Auto-corrected, Algorithmically-generated Homework System

Introduction

This paper documents the motivation behind the use of the Link-Systems International (LSI) MyAcademicWorkshop® online homework resource and alert system and the results obtained at Southern Crescent Technical College in Georgia. We look into the considerations that led to conducting a pilot, the courses where it was used, and the results – direct and indirect – observed, so far as could be determined by an instructor who used the system in his entry-level mathematics courses. At a time when educators seek effective, technologically-advanced software that can improve student outcomes, this paper can help campus leaders make an informed decision about products.



Spencer Hamrick

The Situation: Southern Crescent Technical College

Southern Crescent Technical College has a 50-year history of educating Georgians in the geographic areas south of the Atlanta metropolitan area. While the college has just recently undergone a merger and assumed this new name, its two founding colleges, Flint River Technical College and Griffin Technical College, can both trace their roots back to the early 1960s. These colleges were

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established to address the need for local and cost-effective post-secondary education.

Over the past 50 years, the economic map has been redrawn in the 10-county area that the college serves. In a story repeated in small communities across the South, residents formerly dependent on agriculture and textile mills for employment found their lives transformed. The textile industry began to change; one by one, the mills began to close. Localities found that only the availability of a labor force with specialized training could attract new business. Residents could no longer expect to obtain gainful employment with just a high-school diploma. This new economic reality gave birth to the technical college system.

Since the merger in 2010, the Flint River Technical College located in Thomaston, GA is now considered as simply the Flint River campus while Griffin Technical College located in Griffin, GA is called the Griffin campus. These are the two main campuses of the college while there are smaller satellite centers that serve more local needs. Currently the enrollment split is 518 students at Flint River campus with 4,571 students on the Griffin campus. (12Ju)

Students receive financial assistance through the HOPE Scholarship offered in Georgia as well as federal assistance through Pell. With so many students attending as the result of displacement from a job, the financial assistance plays a key role in making their career change a reality. For the current semester (Fall 2011), 3,492 students receive HOPE, 3,251 students receive Pell, and 234 students receive funding through the Veterans Administration (VA). A smaller number receive local scholarships as well as dislocated worker scholarships and Workforce Investment Act (WIA) funds.

The education level of the incoming student is broken down accordingly: 72.4% of students have high-school diplomas, 13.5% have 1-3 years of post-secondary education and 10.0% have a GED, while the remaining 4.1% are made up of those with less than a high-school diploma. For the largest group (high-school diploma), the percentage matches very well with census data for the general population in the 10-county area. Roughly 75% of the local population holds only a high-school diploma.

In the incoming student population, 26.8% are under the age of 21, 24.6% are between 21 and 25, and 18.0% are over the age of 40. Further breakdown shows the remaining percentages are 11.6% between 26 and 30, 9.7% between 31 and 35, and 9.3% between 36 and 40.

Pulling all the demographic information together, a Southern Crescent student would typically bring a high-school education to the classroom. Half of those would have greater than 7 years of time since that education. If they have their roots in the 10-county area, their parents have no history of college education and a résumé with only experience in local mills. Core mathematical skills are weak, especially by today's competitive standards. As a result, 30% end up in a "learning support" math class, which intends to remediate students who do not have the appropriate mathematical skill to enter in to the first-level math course required by their program of study. These students must pass their course as well as achieve an acceptable score on the COMPASS test, created by ACT.

Mathematical Course Sequence

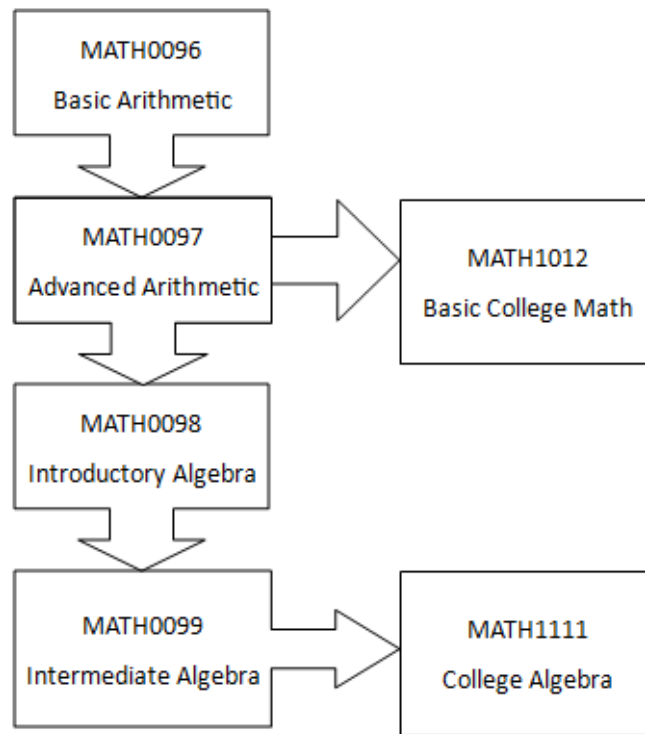


Figure 1 – The Layout of the SCTC Mathematical Course Sequence

The learning support sequence of classes begins at its lowest level in MATH0096. Students that place into this class need help with the most basic mathematics skills, such as counting and the four basic operations of addition, subtraction, multiplication, and division. MATH0097 students will study fractions, decimals, percentages, and basic geometry. MATH0098 begins with a pre-algebra sequence where students learn how to operate with negative numbers and solve linear equations for a single variable. By the end of the course, students are familiar with exponents, polynomials, and factoring simple trinomials. MATH0099 continues with more extensive factoring, solving quadratic equations, rational expressions, radical expressions, and systems of equations. For students in the diploma program, the only course requirement is MATH1012. Students pursuing an associate's degree must complete MATH1111. Depending upon students' ability and choice of degree program, they may need to take only MATH1012 or MATH1111. But many do not have the requisite skills and must start at the appropriate learning support class.

Origins and Development of MyAcademicWorkshop®

- Web technology to fit schedules and learning goals of technical college learners
- Contextualized to student experience and faculty expertise
- Content already proven to match cognitive skill needs
- Content and alerts dynamically adaptable to individual progress

SCTC turned to the educational software development of Link-Systems International. Already using the LSI NetTutor Online Tutoring Service, the campus had experience with the flexibility and responsiveness of the company to campus needs. LSI bases its products and services on Integrated Cognitive-Contextualized Learning (ICCL) theory, which means that its Web-based services and offerings reflect the cutting edge in constructivist educational techniques – a pedagogy-neutral, student-oriented approach that complements the efforts of teachers.

Other applications of ICCL include the NetTutor online tutoring service, mentioned above, which has been shown to contribute significantly to student achievement (Kersaint, Barber, Dogbey, & Kephart, 2011). Most notably, LSI is the developer of the WorldWideWhiteboard® online collaborative learning interface, shown in various studies to further the construction of knowledge and learning structures (Thomas, Li, Knott, & Li, 2006) and the expression of mathematical concepts in real time online (Smith & Klein, 2004).

MyAcademicWorkshop developed out of the combination of a rich and varied authoring effort with a system of automatic notification and alerts. The content developed in the underlying WorldWideTestbank interface has been widely used by content providers for over a decade. MyAcademicWorkshop links this tested content with a workflow enabling either the use of ready-made algorithmically generated problems or instructor assembly of online homework components in a natural, easy-to-understand fashion.

What MyAcademicWorkshop offers Learners at SCTC

- Meeting challenges with student-centered online homework
- Gaining from the expertise of a technology partner

Like many other colleges, SCTC faces a serious challenge when getting students over the mathematical hurdle, especially the algebra hurdle. Even with the use of the publisher mathematics lab, the SCTC “pass-through” rate for the completion of the remedial algebra sequence is low; in the Spring 2012 semester, of the total number of students who signed up for the terminating course in the learning support math sequence (MATH0099), only 35% completed the class and passed the COMPASS. It was with this in mind that the SCTC vice president of academic affairs began to seek options beyond the current system and connected with Link Systems, Inc. Conversations with LSI about this need began just as the company had begun to test its newly augmented graphical user interface (GUI) to access their popular WorldWideTestbank®. Prior to this, the WorldWideTestbank had been used by LSI to author online content for publishers, by online content firms to generate algorithmic problems, and by some schools in conjunction with their popular NetTutor® online tutoring service.

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To address the needs of the SCTC student, the college provides free tutoring. Funding for this tutoring is provided by federal grants. Also many teachers utilize interactive homework assignments that are computer-based. Since mathematics is largely algorithm-based problem-solving, homework assignments and tests can be administered over the internet with open-ended solutions as answers. This type of assignment broadens understanding of the problem-solving methods that students must use rather than focusing on some numerical solution. This is where the SCTC math program hoped that MyAcademicWorkshop would be of value to the students.

Currently SCTC uses a variety of methods to enhance the classroom experience. While some teachers continue to use the traditional pen-paper-textbook homework assignment method, many have branched out to ply the benefits of technology. The college currently uses ANGEL as its learning management system (LMS). In some cases, what would have traditionally been paper assignments have been converted to “soft versions” in ANGEL. While employing technology may serve to enhance student engagement, this method does not provide incremental mathematical learning. Although ANGEL does have an algorithmic question generator, it is too cumbersome to create large quantities of problem sets.

Some textbook companies provide access to online or computer-based services with the purchase of the textbook. When these resources are not “instructor-directed,” that is, when every student has the same access to an optional learning enhancement not required by the teacher, many students fail to take advantage of these services. Normally, for these technological extensions of the course learning to gain traction, the teacher must mandate them as part of the grade for the course. At SCTC, most teachers use a publisher’s mathematics “lab” with their courses. Teachers can select from algorithmic versions of the odd-numbered problems drawn from the publisher’s textbook. While the lab provides additional resources, by and large, its actual use at SCTC is as a body of homework questions.

How Online Homework Sharpens Cognitive Skills

- Banks of algorithmic questions, assignable by the teacher
- Student progress continuously monitored

MyAcademicWorkshop provides banks of questions from which an instructor may select problems. The special benefit of MyAcademicWorkshop is that it is not tied to a textbook, which provides value in differentiation of an assignment. Each problem is structured around a few core parameters but with no specific numeric values. For example, problem parameters are set up following abstract symbols, such $ax + b = c$. But the values of a , b , and c are randomly generated so that a student sees a problem with numbers rather than letters. Simple formula manipulation would show that $x = (c-b)/a$, but MyAcademicWorkshop has algorithms built around this solution as well as many of the common incorrect methods that students use to solve this problem. Additionally, a hint feature is available to provide students with direction in case any difficulty is encountered. Through such assignments, students quickly receive help that they may not otherwise receive. They do not require their instructor and MyAcademicWorkshop essentially serves as a secondary instructor to the student to remind students of the problem-solving methods that were taught in class.

Implementing Homework Technology

- Homework is one click away – right in the school LMS
- Students work real-world problems
- Problems target specific learning goals and learning styles
- Instructors get progress notifications as they choose

Beginning in the Fall of 2011, SCTC faculty utilized MyAcademicWorkshop in MATH1012 and MATH0098 courses (see Figure 1), with one section of MATH0098 and MATH1012 each semester using MyAcademicWorkshop. Course rosters are typically 20+ students. Students enter MyAcademicWorkshop through a single sign-on through their ANGEL account, eliminating the need for a second login and password (although MyAcademicWorkshop does provide for manual account creation).

Students Completing Their Mathematics Requirements

- Content of homework problems reflects real-world goals of students

The MATH1012 course is the terminating course for students on the diploma track. This course provides plenty of real-world applied problem-solving methods that are used in everyday areas of their future employment. Cosmetology students learn how to add fractional portions of hair coloring, nurses learn to convert ounces to cubic centimeters, and automotive students learn how to apply ratios as needed in an understanding of engine compression ratios. Concepts of algebra are not taught in this course; the focus is on the technical applications of mathematics. So using problems that stretch the bounds of the textbook becomes a necessity. No real-world problem ever presents itself in the same way and so homework differentiation is a must. Given the decreased focus on rote problem-solving and the accent on contextual problem-solving, MyAcademicWorkshop has provided an excellent way to stretch beyond the textbook. Outcomes have improved, particularly for those students weakest in mathematics. The students most challenged by mathematics, it was observed, enthusiastically took advantage of the virtual “playground” provided by MyAcademicWorkshop-based homework to learn experientially.

Students New to College or With Limited Math backgrounds

- Algorithmic content triggers proximal learning zones, even for those with severe math deficits

In MATH0098 courses, students are just beginning the initial algebra sequence. This class tends more toward rote problem-solving since the myriad presentations of problem types must be shown. Students are expected to solve problems with integers as well as fractional and decimal values. Using identical coefficients in a problem like $2x + 3 = 5$ and changing the signs of the numbers can perplex students for extended amounts of time as they learn the initial algebraic manipulation processes. In this course, plenty of examples must be provided and at times, the textbook may not have all the potential variety of problems desired. Additionally, the applications to real-world problems are provided *in situ* by the test bank so that students may immediately see some connection to a real-life problem.

What was Observed at SCTC

- Increased student engagement
- More positive attitude toward math study
- Increased sense of accomplishment
- Better overall class scores on exams
- Transparent, easily managed integration

As previously noted, the technical college environment has a considerable number of “adult” or nontraditional students. These students have typically been away from college for more than 5 years and return out of necessity to improve their marketability as an employee. This absence from the academic setting does not bode well for these students. Many of them face short-term memory misgivings, test anxiety, and an overall disjointedness with the concepts of algebra. Coupled with the fact that many of them face “real-world” pressures and responsibilities at home, with family and its associated financial strains, the opportunity to immerse themselves in the subject and its study is greatly hampered.

These students find online homework to be a boon to their understanding. The use of a system such as MyAcademicWorkshop allows them to place themselves in the problem-solving mode with a “safety net” provided in the form of problem assistance. Ordinary textbooks may only demonstrate one example and it requires student study and examination to find the best example to help them solve the particular problem that has been posed. MyAcademicWorkshop provides “on-demand” support and this allays many of the fears of the student.

The Right to be Wrong – and to Find out How to Fix It

- Experimentation in application of ideas: an essential component of online homework
- Help when you need it: a way for students find what out they need to know

Fundamentally, homework should be a place where students have the freedom of trial and error. As with practice of any subject, skill, or trade, giving the practitioner a wide berth so that they may try a solution and “see if it works” provides true experiential learning. In MyAcademicWorkshop, the student is permitted to try problems as many times as they require until they find the correct answer. The instructor may also set the number of attempts in which a student must find the correct answer. Should the student exhaust her allotted number of attempts without arriving at the correct solution, the system can generate another problem of the same type; the numeric values in the new problem are algorithmically (i.e., randomly) generated but require the student to make use of the same principles. This aspect of MyAcademicWorkshop truly enhances students’ sense of self-efficacy. This is evidenced through one student comment on a written survey, “I benefited from MyAcademicWorkshop. I have never made a B in math ever!”

Using MyAcademicWorkshop provides fresh problems beyond the scope of the textbook. Students take algebra, not for its mathematical problem-solving, but for its application in the real-world problem-

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solving that must occur. Finding “ x ” correlates to finding unknown solutions to problems faced by their future employers. MyAcademicWorkshop targets, through a balance of rote problem-solving and contextual problem-solving, this precise learning step. Instructors, freed from the tie to a single textbook and the problem types that it provides, may search banks of test questions and choose those which focus on the learning goal – the desired approach to a problem.

Additionally, the help features within MyAcademicWorkshop provide varying levels of support. For those students who basically have the understanding of the concept and need only the slightest of support, they may access a hint that is very brief and may include a keyword or specialized hint. Students who go blank, but have seen and previously understood a problem type may access a feature that will work the problem they are given and then algorithmically generate another version of it. Finally, for those students who still do not have an understanding, there is a feature that shows the step-by-step process where students are asked to enter in portions of the answer along the way. Upon completion of the problem, they are also given another version of that problem.

Faculty Notes

- Extends the “instructional arm” of the course
- Supports students with mathematics or computer-skills deficits
- Contributes to markedly higher performance outcomes

Students have responded positively to the use of MyAcademicWorkshop. It has augmented the reach of the “instructional arm” of the course. Initially, as with any new method, especially one that is technological, some students have resisted. However, once the initial unrest has been resolved, students find that the ability to do homework when they want and how they want gives the academic freedom to learn according to their own schedule. In fact, the use of technology augments their learning of more than simple mathematical topics. Students typically come to the classroom with a deficiency in computer-related manipulation and the course indirectly teaches them some of the rules of internet use and data entry. In these classes, the former homework assignments are offered to the students as an extra study guide for the test. The students that take advantage of both MyAcademicWorkshop and the study guides have found great success, as measured both by their classroom grade and their technical application of mathematics. Students leave the course feeling more confident about their ability to solve problems that may be encountered in real-life or in future math courses later in their course sequence.

Impact on Pedagogy

- The instructor learns from student responses to homework

Using MyAcademicWorkshop alters the depth of instruction required in the course. For the upper echelon of students, gaps are intentionally left in the instruction and problem types not seen in class are presented in the homework. It allows those students an opportunity to stretch their learning. Students in the lower echelon of understanding also see this and other similar problems. However, there is less trepidation on the part of instructor as it relates to decreasing student self-efficacy. These students, with the appropriate time and effort spent using the help features, can also find success. Students can no

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longer sit idly by and watch the instructor perform the problem-solving steps and then mimic them on the test to achieve success. They must look holistically at the problem-solving method.

The higher level of student engagement achieved through MyAcademicWorkshop presents a challenge for the instructor to meet. A careful balance of classroom instruction and at-home support through MyAcademicWorkshop must be maintained. One feature of MyAcademicWorkshop that assists in this is a built-in and customizable system of alerts. The instructor will set markers by which they will know when students' achievement levels falter. The instructor can then consider whether there may not have been enough instruction when students were asked to solve difficult problems independently. Another tendency of students is to become bored and more mechanical with problem-solving if the homework problems appear to be busy work that copies step-by-step methods taught in class. This can be captured by system feedback that shows when a student stops completing assignment.

In general, using these tools and applying best instructional practices, SCTC instructors have found an excellent balance between challenging the student to think and reinforcement of skills. This can be seen through the "top-flight" student who comes to class with a small grin and says, "Problem #21 really made me think twice," and the anxious student who says, "It took me two hours, but I did that homework all by myself."

Technical Issues

- A moderate learning curve that pays off in the short and long runs
- Excellent technical support at the course and institutional levels

As with any new software, there is a learning curve to create and manage assignments. However, the MyAcademicWorkshop arrangement follows a much simpler architecture than other similar products. Typically, the management of questions and responses uses Adobe Flash Player®. The popular Apple mobile devices (iPad, iPhone) do not operate on Flash, which makes accessing Flash-based homework impossible unless sitting at a desktop or laptop Windows computer. MyAcademicWorkshop does not rely on Flash Player. In a written assessment, one of the authors described the situation as follows: "As an instructor, this allows me to check grades, assist students with particular problems, and make assignment updates –all from my tablet. Students were also able to use their mobile devices to complete homework, which add[ed] another dimension of flexibility for the student to engage with the material." (Hamrick, 2012)

Additionally, the assignment questions provide the right balance of information in a math problem. The challenge for students in mathematics is to take a limited piece of information and complete the jigsaw puzzle to find a solution. Additionally, students must then properly enter the answers, following the appropriate syntax, which further ensures understanding of mathematical representations. The questions in MyAcademicWorkshop use myriad methods such as simple statements like "Solve" to detailed charts in contextual applications that shoot straight to the top of Bloom's taxonomy.

Assignment management in MyAcademicWorkshop follows a very intuitive design. Assignment start and due dates are easily modified. Assignments may be easily deleted, but later recaptured from the course

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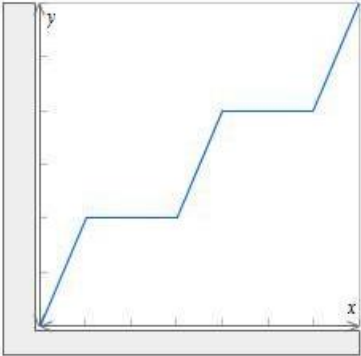
syllabus if needed. This is helpful to the adaptive instructor, who realizes that every class is different and some need more practice in certain areas and others do not. Alterations to assignment settings are not buried 3 button clicks deep in a hidden menu.

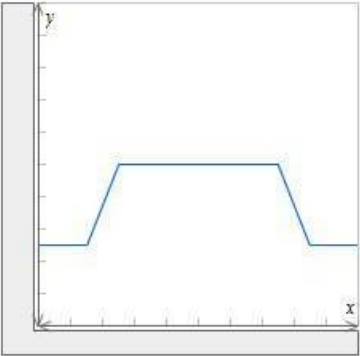
As mentioned already, integration into the college ANGEL site at SCTC provided a natural way for students to access their homework. Better still, LSI technical staff and product managers have made themselves available and reachable any time a question has come up. Faculty at SCTC found that their input was genuinely valued by LSI. This experience showed that the company develops software in an active pursuit of the ideal of constructivist learning support, namely, help the teaching to *facilitate* learning.

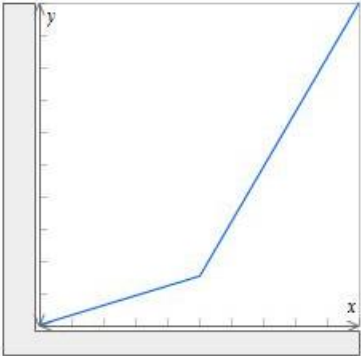
Question 15 1 out of 3 attempts

Using the concept of slope, select the graph that best illustrates the following story:

"While on my daily walk, I had to run for a while when I was chased by a stray dog."

A. 

B. 

C. 

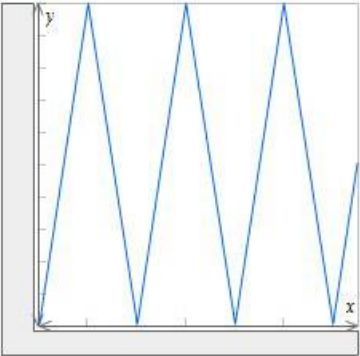
D. 

Figure 2 – A Sample Problem From MyAcademicWorkshop®

Results and Conclusions

- Easy acceptance by students leads to the best student outcomes in the course
- Problems help students learn to think about mathematical concepts

In just the first semester of its use, MyAcademicWorkshop already showed gains in student achievement. Figure 3 shows the trend of test scores over the prior three terms on two areas of an introductory algebra course in gray followed by student achievement using MyAcademicWorkshop. As these two topics are the fundamental cornerstones of an introductory algebra course, the gains in test scores suggest very favorable prospects for these students' continued success in advanced algebra.

The nature of those problem types within these two topics provided students with more interactive problems. To see an example of this, consider the problem in Figure 2. Investigation of this problem stood out in classroom discussion and led students to engage in lively discussion about the nature of graphs and slopes. In this problem, students offered many opinions about which graph might adequately describe the problem statement. In fact, one student comment pushed the boundaries of math class and investigated the nature of physics.

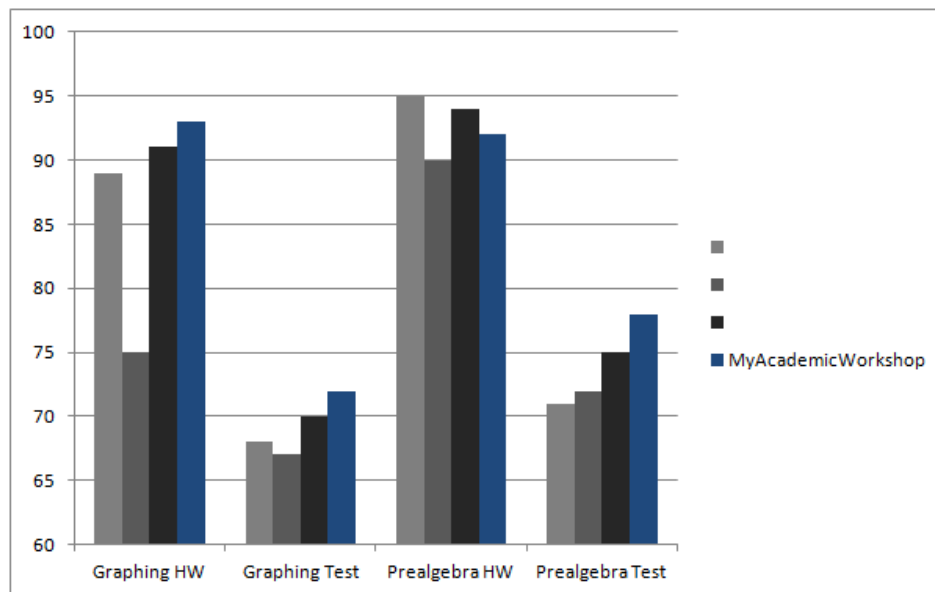


Figure 3 – Outcomes of students using various learning strategies

The student suggested that answer C would be a correct response if distance versus time were the axis labels. However, if velocity versus time were the labels, answer choice B would be more appropriate. As one of the authors assessed the situation, "as the discussion progressed, I eventually convinced students that we were having discussions that would occur in a calculus class, as we thoroughly investigated the notion of slope. A few dubious students asserted that we had no desire to get into calculus in an introductory algebra course. However, our 10-minute discussion on this problem provided plenty of

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discussion around the nature of slope, whether or not they liked the moniker of ‘calculus.’” (Hamrick, 2012)

Going Forward

The use of MyAcademicWorkshop at SCTC has paid off, even at this pilot or experimental level. The technical college environment is increasingly attractive to students looking for ways to improve their marketable job skills, acquire additional certifications, and to compete in an increasingly difficult global labor market. At the same time, many “traditional” students seek less costly learning alternatives afforded by the technical college. This means a growing demand for basic mathematics skills and for efficient and effective tools to serve a larger college population. MyAcademicWorkshop addresses this fundamental change that is going on and that affects the population of southern Georgia and many other parts of the US.

This paper has explored why MyAcademicWorkshop is different from products that seem similar – so-called “labs” for subject-based homework. MyAcademicWorkshop offers a full range of algorithmic homework content, at the discretion of the instructor or department, while providing automated notifications regarding student progress at levels and intervals determined by the instructor or department. As emphasized, observed results include a better, more participatory approach by students to mathematics, numerous opportunities to direct and deepen classroom discussion around essential learning objectives, and better overall performance on the course final exams.

In coming semesters, we hope to analyze more closely the precise relationship of student attempts and successes with algorithmic content to help-seeking behaviors and net achievement gains. MyAcademicWorkshop will make all of this measurable. We know that online homework with custom algorithmic content and detailed alerts and notifications for the educator encourages students’ mathematics learning. The aim of contemplated research will be to determine how this encouragement takes place.

In the meantime, it is clear that any institution seeking to play a more refined, exact part in helping students overcome difficulties in mathematics should consider the use of MyAcademicWorkshop. There is no need to be confined to the path of the textbook and every reason to make use of the many options afforded by the skilled authoring, attractive interface, and detailed feedback of this product. Southern Crescent Technical College will continue to move forward, confident that digital support addressing the real problems of today’s learners is available.

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About Southern Crescent Technical College

Southern Crescent Technical College Mission Statement

Southern Crescent Technical College provides relevant technical education and workforce training programs via traditional and online formats that promotes lifelong learning and economic development in the southern crescent region of central Georgia.

Our College

Southern Crescent Technical College was established in July 2010 from the merger of Flint River Technical College (FRTC) and Griffin Technical College (GTC). Southern Crescent Technical College is a flagship technical college in the state, with a combined student population of over 6,500 credit students. As one of the largest technical colleges in Georgia, the two campus locations and three centers will serve the workforce and community needs of the over 500,000 citizens in the ten counties of the South Atlanta region including Butts, Fayette, Henry, Jasper, Lamar, Pike, Spalding, Talbot, Taylor, and Upson counties.

The College will also serve an additional 3,500 students per term in Adult Education and Continuing Education programs. Southern Crescent Technical College will offer nearly 200 associate degree, diploma, and technical certificate programs to provide the trained workforce needed to help stimulate Georgia's community and economic growth and development.

About Link-Systems International, Inc.

Link-Systems International, Inc. (LSI) is a market-leading software company that helps academic institutions create effective digital solutions for teaching and learning. Many of the best-known brands in education use our web-based platforms:

- NetTutor® – our online tutoring solution
- MyAcademicWorkshop™ – our adaptive placement, assessment, and homework system for mathematics
- WorldWideWhiteboard® – our mobile-ready collaboration suite
- Information Visibility Solutions™ – our enterprise analytics dashboards for education

Research-Based Approach

LSI employs Integrated Cognitive-Contextualized Learning (ICCL) in order to deliver research-proven online learning solutions that are based on the latest developments in learning theory. Educators work hard to engage students and to help them reach their learning goals; we offer theory and practice to supply educational technology in support of that work. LSI has recognized the unity of two important arms of constructivist learning theory—the measurement of self-achieved cognitive advances against agreed-upon standards and the contextualization of learning to create learning initiatives for the active learner.

Over the years, LSI has accumulated a wealth of experience with educators seeking new ways to engage their students through unique and involving learning experiences and measure and reinforce concrete cognitive advances. According to ICCL, these are simply two sides of the same experience: implementation of online learning tools enables both the delivery of contextualized content and the verification of learning achievement.

The application of ICCL has practical results for LSI, whose solutions are all based on the theory. LSI uses ICCL to develop solutions that meet the specific needs of its learning institutions and their partners. At the same time, these solutions make educational achievement measurable to ensure learning success while peer-reviewed research supports their effectiveness. The partnerships between educators and LSI are helping to define the new face of quality learning in the digital age.

Our Company

Launched in 1995, LSI has created several unique and powerful software platforms that facilitate the sharing of content over the Internet. We specialize in mathematics, technical and scientific content, the most critical types of online content with respect to student persistence, and the most difficult to share online.

Our customers include K-12 publishers, higher education publishers, virtual high schools, higher education institutions, technology companies, and joint programs dedicated to providing online educational content to members of organized labor and their families.

MyAcademicWorkshop in the Technical College Classroom

We are located in Tampa, Florida, a few miles from the University of South Florida, which has excellent engineering, computer science and mathematics programs, providing LSI many of its employees.

Student Persistence and Retention

Today, LSI is recognized by a variety of publishers and educational institutions not only for its high-quality work and dedication to meeting commitments, but also for its unique ability to develop digital solutions that are tailored to the needs of its customers.

Our partners and customers have come to value and trust LSI because we are the only company that offers a complete suite of interoperable solutions that address the entire life cycle of the student, with an overt focus on the bottom line: student persistence and student retention.

LSI Mission Statement

Link-Systems International is the leader in providing integrated technology and service solutions to educators in order to improve the quality of education and training, ensure student success and retention, and provide affordable education to students, workers, and their families.

Corporate Executive Team

Vincent T. Forese, President, Chief Executive Officer

William K. Barter, Senior Vice President, Sales, Marketing, and Business Development

Dr. Emil Moskona, Senior Vice President, Chief Operating Officer

Dr. Yanmu Zhou, Senior Vice President, Chief Technology Officer

Dr. Milena Moskova, Vice President, Research and Development

MyAcademicWorkshop in the Technical College Classroom

About Academic Research at LSI

We are enthusiastic about the commitment of institutions and academics to the use of technology with proven benefits to their students. If you would like to write about the impact of Web-based technology, please let us know. We encourage educational research and will work with you and your staff to develop scientific studies into the relationship of the online learning experience to successful student outcomes. Please contact our Academic Research Department.

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