PALs: Fostering Student Engagement and Interactive Learning

Thomas Hancock, Stella Smith, Candace Timpte, and Jennifer Wunder

Introduction

In 2002, the Association of American Colleges and Universities (AAC&U) issued the report *Greater Expectations: A New Vision for Learning as a Nation Goes to College*, and called upon educators to rethink and reinvigorate education for the 21st century by embracing the concept of a "liberal education" that enables students to become empowered, informed, responsible, and intentional life-long learners *(Association of American Colleges and Universities, 2002)*. Drawing upon extensive research regarding educational practices and in-depth explorations of innovative learning models from almost two dozen campuses, the report consistently stresses that liberal education is most effective "when studies reach beyond the classroom to the larger community, asking students to apply their developing analytical skills and ethical judgment to concrete problems in the world around them, and to connect theory with the insights gained from practice" *(Association of American Colleges and Universities, 2002, pp. 25–26)*.

There is ample evidence to support *Greater Expectations*' emphasis on learning strategies that merge intellectual and practical skills, including research indicating that students report increased motivation and display deeper learning and better retention when asked to solve real-world problems and construct knowledge from their experiences both in and beyond the classroom *(Ames, 1992; Downing, Kwong, Chan, Lam, & Downing, 2009; Edens, 2000; Hmelo-Silver, 2004)*. Not surprisingly, increasing numbers of educators in the last few decades also have asserted that active learning, learning by doing, is a rich and engaging strategy *(Bransford, Brown, & Cocking, 2000; Herrington & Herrington, 2006; Lombardi, 2007b; Ramsden, 2003)*. However, many students are still taught via the stand-and-deliver approach. A lecture format continues to dominate many classrooms not only because of the challenges posed by designing and assessing active learning projects drawn from real life, but also because of concerns regarding various factors such as class sizes, time constraints, and content. Concerned with delivering the necessary content knowledge in a limited amount of time, instructors can feel compelled to focus on delivering the facts that students are

expected to reproduce on exams, without putting learning in a real-world context *(Herrington & Herrington, 2006; Lieux, 2001)*.

This approach, however, fails to take advantage of insights gained from research regarding how people learn, and it often does not best serve students' needs and goals or those of higher education and the communities in which colleges and universities reside. This is particularly true as more scrutiny is placed on higher education to ascertain whether learning outcomes correlate to skills desired in the workplace. A key finding of not only the *Greater Expectations* report, but also a more recent 2007 report of the Commission on the Skills of the American Workforce, is that today's educational systems have failed to adopt creative and challenging approaches to learning because these systems were built for another era. Addressing the leadership needed to make deep and lasting changes to our educational system, the Commission stated: "That kind of leadership does not depend on technology alone. It depends on a deep vein of creativity that is constantly renewing itself" *(National Center on Education and the Economy, 2007, p. 6)*.

How, then, can educators address this problem and not only take the lead by adapting classroom practices to facilitate the kinds of learning necessary for success in the 21st century but also, in the process, create the leaders of tomorrow? How can we combine subject knowledge with technological innovation while also drawing on the creative tendencies and resources to be found in our colleges and our communities and encouraging the same creative tendencies in our students? Finally, what approaches should colleges and universities take to provide learning outcomes appropriate to these goals? Georgia Gwinnett College (GGC), the nation's first new baccalaureate liberal arts college of the 21st century, is committed to finding answers to these questions.

Literature Review: The Value of Authentic Learning Pedagogy

As the body of literature and number of proponents supporting active and deep learning in experiential, problem-based, and real-world contexts grow, teachers have increasingly begun to incorporate more "authentic" learning methods into the curriculum *(Bransford et al., 2000; Hmelo-Silver, 2004; Merrill, 2007)*. Authentic learning is generally defined as learning centered on rich, immersive, and engaging tasks. It is considered participatory, experimental, and carefully contextualized via real-world applications, situations, or problems, and it can be extended to incorporate a variety of activities or exercises such as the use of role-playing,

case studies, and simulations that assist students in acquiring both knowledge and transferable skills *(Herrington & Herrington, 2006; Lombardi, 2007a, 2007b; Merrill, 2007)*. Based on an extensive review of research regarding authentic learning, Herrington, Oliver, and Reeves *(2003)* have proposed that authentic learning activities

- have real-world relevance;
- are ill-defined, requiring students to identify tasks to complete the activity;
- comprise complex tasks to be investigated by students over a sustained period of time;
- provide the opportunity for students to examine the task from different perspectives, using a variety of resources;
- provide the opportunity to collaborate;
- provide the opportunity to reflect;
- can be integrated across different subject areas and lead beyond domain-specific outcomes;
- are seamlessly integrated with assessment;
- create polished products valuable in their own right rather than as preparation for something else; and
- allow competing solutions and diversity of outcomes *(pp. 61–62)*.

Although multiple, more specific views on the criteria for authenticity also exist, opinions regarding this reflect not so much a disagreement about the goals underlying authentic learning as an awareness of the flexibility and range of possibilities for incorporating it not only across disciplines but also across environments (e.g., face-to-face, blended, and distance learning environments). Herrington and Herrington *(2006)* have emphasized that the key is to "provide an authentic context that reflects the way the knowledge will be used in real life," and "that it is the cognitive authenticity rather than the physical authenticity that is of prime importance in the design of authentic learning environments" *(pp. 3–4)*.

Examples of authentic learning and the forms it takes can be found on many college campuses. Students in history courses at the University of Virginia (UVA) participate in an ongoing project in which they act as historians and produce "episodes" that analyze and synthesize data from the Southern History Database. They

contribute these episodes to the UVA *History Engine*, a searchable online database documenting and providing insight into the 19th century American South *(Lombardi, 2007a)*. Purdue University students use sophisticated simulation software and materials via Purdue's *nanoHUB* online portal to conduct nanotechnology experiments and engage in an online research community *(Lombardi, 2007a)*. At Dickinson College, some students participate in learning communities with politically, socially, or civically relevant themes tied to service-learning cocurricular activities designed to promote deeper learning and to help students make personal connections between their education and the broader community in which they live *(Association of American Colleges and Universities, 2010)*. Princeton University's Community Based Learning Initiative brings together faculty members and community leaders who identify research projects that will benefit community organizations. Students enrolled in participating courses have the option to conduct directed, hands-on research, the results of which they share with both the faculty members and organizations involved. Their efforts not only result in greater student engagement with the subjects studied, but also enable them to make meaningful contributions to the community *(Princeton University, n.d.)*.

As these examples suggest, there are many ways to deploy authentic learning in the classroom, and activities and projects exist upon a continuum in which some might be considered more "real" than others. Herrington and Herrington *(2006)* and others have correctly noted, however, that authenticity should not be confused with absolute "fidelity" or verisimilitude when it comes to creating an environment or learning scenario. In some instances, particularly those of simulations, there is evidence suggesting that novice and intermediate learners may even attain outcomes at a higher rate when only a moderate degree of verisimilitude exists *(Alessi, 1988; Tashiro & Dunlap, 2007)*. In fact, research about what authentic learning is, and what it need not be, suggests that students are quite willing to engage in a suspension of disbelief and can learn effectively as long as learning environments make manifest and encourage students to build connections between what they are doing in a course and the world beyond *(Herrington, Oliver, & Reeves, 2003)*. The point is to create scenarios or activities that students can conceive of as occurring in reality and that require students to engage with the discipline-specific concepts, principles, and skills that they need to learn *(Savery & Duffy, 1995)*.

The value of active, student-centered, problem-based, and authentic learning models has been documented at all levels of

higher education. For example, in his review of research regarding multiple methods defined as active learning, Prince *(2004)* found that active learning results in a wide range of improved learning outcomes, both content- and skills-based. In *Problem-Based Learning: A Research Perspective on Learning Interactions,* Hmelo and Evensen *(2000)* concluded that students engaged in variations of problem-based, authentic learning attend class more often, see material studied as more relevant, value what they are learning more, learn to collaborate more effectively, and express greater levels of motivation and more confidence in their problem-solving skills. When active, student-centered, problem-based, and authentic learning processes were compared to more traditional teaching methods, Ames *(1992)* found that they promoted deeper understanding and, again, greater motivation than other methods. Blumberg *(2000)* noted that they increased students' capacity for self-directed learning; and Dochy, Segers, van den Bossche, and Gijbels *(2003)* and Hmelo and Lin *(2000)* argued that they compelled students to assess knowledge bases; identify and develop learning strategies and plans; transfer those strategies to new problems; and effectively integrate, synthesize, and retain knowledge. Many practitioners and researchers have echoed these conclusions *(Duke, 1999; Moore, Cobb, & Garfield, 1995; Root & Thorne, 2001)*.

Authentic learning has these effects because it provides students with meaningful experiences where they feel their efforts can impact those around them *(Pintrich & Schunk, 1996; Shwartz, Lin, Brophy, & Bransford, 1999)*. When students engage in properly contextualized exercises or take part in lines of inquiry or projects that simulate experiences valued by the discipline of study and relevant to the world outside academia, they tend to persevere, even in the face of incomplete or misleading information *(Herrington et al., 2003)*. They also spend more time, in general, working with assigned materials at more meaningful and applied levels. They experience the materials in several different contexts, and the increased "depth of processing" significantly improves long-term retention of the materials *(Bjork & Richardson-Klavhen, 1989; Craik & Lockhart, 1972; Healy & Sinclair, 1996)*. Furthermore, this type of learning provides opportunities for knowledge transfer from abstract to contextual, concrete realms, which has been shown to improve student comprehension *(Ewell, 1997; Wason & Johnson-Laird, 1972)*.

In addition, authentic learning not only enables students to build connections between specific content learned in classes and future careers, but also helps them acquire broader disciplinary knowledge and helps them see the role such knowledge might play

in addressing contemporary issues *(Windham, 2007)*. As Siemens *(2004)* has argued, educators should aspire to make connections precisely because they strengthen students' overall abilities to learn. In *Authentic Learning for the 21st Century: An Overview*, Lombardi *(2007b)* effectively summarizes the research of Jenkins, Clinton, Purushotma, Robison, and Weigel *(2006)*: authentic learning can empower students by providing them with

- the judgment to distinguish reliable from unreliable information;
- the patience to follow longer arguments;
- the synthetic ability to recognize relevant patterns in unfamiliar contexts; and
- the flexibility to work across disciplinary boundaries to generate innovative solutions *(p. 3)*.

The Partners in Active Learning (PALs) Program at Georgia Gwinnett College

The College Context

Georgia Gwinnett College (GGC) opened its doors in 2006 and accepted its inaugural class of first-year students in 2007. During the 2007–2008 academic year, faculty members and administrators worked together to develop a model for Partners in Active Learning, or PALs—an initiative designed to fit the GGC vision and mission to build an outcomes-based college that offers students an "integrated educational experience" based on continuous learning "in and beyond the confines of the traditional classroom" *("About GGC," n.d.)*. The college's mission "emphasizes the innovative use of technology and active-learning environments to provide its students enhanced learning experiences and practical opportunities to apply knowledge" in order to produce "contributing citizens and future leaders for Georgia and the nation" and graduates who "are inspired to contribute to the local, state, national, and international communities and are prepared to anticipate and respond effectively to an uncertain and changing world" *("About GGC," n.d.)*. PALs is a direct response to the *Greater Expectations* report as well as the 2006 Spellings Report calling upon schools to "embrace a culture of continuous innovation and quality improvement by developing new pedagogies, curricula, and technologies to improve learning" and draw upon research of the last few decades regarding authentic learning

(U.S. Department of Education, 2006, p. 5). Moreover, it is an effort to meet the educational demands and "Essential Learning Outcomes" of the 21st century articulated in the 2007 and 2008 reports "College Learning for the New Global Century" authored by the AAC&U's National Leadership Council for Liberal Education & America's Promise (LEAP) *(Association of American Colleges and Universities, 2007, 2008)*.

The basic PALs model is one in which faculty members from multiple disciplines team with community partners and each other to focus their teaching efforts in their courses on cross-course collaborative projects that provide a rich learning environment in which students critically evaluate and respond to real-world issues. To make a PAL, college faculty, staff, and students

- collaborate with the community to identify issues of interest;
- select topics adaptable to study in a range of courses;
- form small groups of courses across disciplines;
- coalesce around projects aligned with a variety of course objectives and outcomes;
- work together to reach goals defined by the college and community; and
- present project results to the college and partnering community organizations.

PALs projects can comprise a mix of lower- and upper-level classes and include a range of activities applicable across knowledge domains. To name only a few example activities, a PALs project might include

- cross-course peer mentoring via mixed teams drawn from all involved classes;
- guest lecturers and community speakers presenting information across classes;
- student presentations across classes with one class presenting project plans, core knowledge, and/or project materials to other classes involved;
- communication among classes in synchronous and asynchronous environments using various forms of multimedia; and
- service-learning events with community organizations.

In fall 2008, faculty members at GGC began implementing and refining the PALs model in their classrooms. This article details the grounding principles of PALs; the implementation, growth, and refinement of PALs pilot projects over the course of three college semesters; and the challenges faced and the solutions devised to answer those challenges as well as strategies for readers interested in creating a PALs program on their campuses.

Georgia Gwinnett College is an outcomes-based college that places strong emphasis on interdisciplinarity, teaching, and purposeful student engagement. The college has neither tenure nor departments. Faculty members are required to submit annual portfolios to their deans for evaluation documenting their work and achievements in four areas: teaching, student engagement, service, and scholarship. The most weight is placed on strong teaching and student engagement. Significant value is placed on service to both the college and the community and to scholarship, including scholarship of engagement that meets two of the college's institutional goals: (1) "engage with Gwinnett [County] and surrounding communities to support student development and community needs," and (2) "serve as a resource for innovation for the broader educational community" *("About GGC," n.d.)*. PALs projects effectively incorporate three of the four areas of faculty evaluation, and include potential for scholarship in the fourth. Thus, PALs projects represent an attractive option for GGC faculty. In addition, because the college is outcomes-based, all faculty members must document student achievement of outcomes in individual courses taught. This acts as an incentive for faculty members to adopt effective teaching methods such as authentic learning. The combined emphases on teaching, broad and varied engagement, service, and curricular assessment are designed to foster and explicitly reward creativity and innovation within an interdisciplinary environment that yields contributions to the community. PALs projects are particularly well-suited to meeting these goals.

The college's defined student learning outcomes, including general education competencies, also lend themselves well to PALs projects. At present, GGC has identified seven Integrated Educational Experience (IEE) outcomes that produce civically engaged graduates.

1. Clearly communicate ideas in written and oral form.
2. Demonstrate creativity and critical thinking in inter- and multidisciplinary contexts.

3. Demonstrate effective use of information technology.
4. Demonstrate an ability to collaborate in diverse and global contexts.
5. Demonstrate an understanding of human and institutional decision making from multiple perspectives.
6. Demonstrate an understanding of moral and ethical principles.
7. Demonstrate and apply leadership principles *("Institutional Effectiveness," n.d.).*

Students are expected to achieve these outcomes through involvement across campus in courses, in groups, and in activities that encompass the entire student experience. General education outcomes specific to the core curriculum feed into Integrated Educational Experience outcomes. Beyond the core, each disciplinary major program offered at GGC defines outcome goals that are linked to the Integrated Educational Experience outcomes. Vertical integration is required throughout. At the course level, faculty members within a discipline designate course-specific outcomes that intentionally support general education outcomes and thus the Integrated Educational Experience outcomes. These Integrated Educational Experience outcomes, in turn, support the college's mission, vision, and institutional goals. This systemic outcome integration means that when designing courses, faculty members across disciplines always have at least one common Integrated Educational Experience outcome upon which to collaborate. This holds true in upper- or lower-level courses and in skills- or content-based courses.

Moreover, because the Integrated Educational Experience outcomes are specific not only to college courses but also to the entire college experience, the institution's divisions, such as Student Activities and Affairs, are also charged with helping students meet the outcomes. As a result, participants in PALs projects come from all sectors of the college. Participants include administrators, faculty members, and students from the Schools of Liberal Arts, Business, Science and Technology, and Education as well as vice presidents, directors, and staff members from offices such as the Center for Teaching Excellence; Educational Technology and Media; Public Affairs; Advancement and Development; and Service-Learning, Active Citizenship, and Community Engagement. The common college goals encourage widespread support and participation that have been significant factors in the success of PALs.

The PALs Model: First Steps to Develop

The PALs model at GGC was developed with the previously discussed principles, practices, and goals in mind. During the 2007–2008 academic year, members of the faculty and administration formed a committee to explore the benefits of authentic, enriched learning, and to design a process for faculty members to more easily create the kinds of collaborative and interdisciplinary environments that make authentic learning possible in not just one class or course, but across multiple classes and courses. At the end of the year, the committee submitted for approval to the vice president of Academic and Student Affairs a proposal that (a) described the ways in which the mission, goals, outcomes, and possible activities for a PALs program would align with the college's mission, vision, and institutional goals; and (b) proposed organizational structures under which PALs would operate. The PALs steering committee was created to oversee projects proposed by faculty teams; to identify, initiate, and facilitate contact with possible community partners; and to coordinate interactions among faculty teams, the administration, and community partners, thereby allowing professors to focus on PALs projects at the classroom level. As a college-wide committee, PALs falls under the purview of GGC's vice president of Academic and Student Affairs, who lends support to the initiative.

The PALs Pilot Project: Implementation

During the summer of 2008, a small number of faculty members designed PALs projects and submitted them to the PALs steering committee for approval. The steering committee selected one project for the initial PALs pilot during fall of 2008. For the PALs pilot project, Georgia Gwinnett College was the "community partner." This allowed the project leaders to test a PALs interdisciplinary project and the teaching methods involved on a limited scale. It also enabled the PALs committee to easily assess the pilot project's challenges and successes and to make modifications to the PALs model before promoting it to the Gwinnett County community. Students in Jennifer Wunder's Composition I class teamed with members of Candace Timpte's Principles of Biology class to collaborate on a joint project to raise awareness on the GGC campus about the potential national and global impacts of genetically modified and bioengineered foods. The faculty members and the 42 students enrolled in the classes selected the topic together based on content requirements in the biology course and the stated outcomes for both courses.

The PALs pilot project: What the students did.

The PALs pilot project students planned and executed "BioQuest: Genetically Modified Foods and Organisms," an educational event that took place at the end of the semester in the primary public student venue on the campus. The event included taste testing of genetically modified and non–genetically modified foods, student-made research posters, and trivia quizzes to test what participants learned at the displays and tables. About 200 people, representing 12% of the campus community, attended the event.

To prepare for the event, the PALs pilot project students completed individual and team writing assignments; gave individual and team oral presentations to peers, members of the administration, potential sponsors, and event participants; drafted work plans, task lists, timelines for deliverables, and budgets; held meetings with Student Activities and Affairs staff; completed requests for sponsorship forms required by the Office of Development, and solicited sponsorship from entities outside GGC; planned, designed, and sought and received approval for promotional materials and images, including t-shirts; completed periodic team- and self-assessment forms and reports; and collaborated across the two courses (composition and biology) to conduct research on genetically modified and bioengineered foods, and to craft research displays with written and visual elements for use during the event. Throughout the semester, students identified and invited to their classes guest speakers who could provide the content and workplace knowledge. As a result of their PALs pilot project, students' authentic learning efforts met course and college outcomes.

The PALs pilot project resulted in significant and meaningful work for the students and demanded that they operate in a flexible, changing, and sometimes uncertain environment. The students engaged in negotiations, often compromising, as happened when their original promotional images were not approved due to copyright and fair use concerns. The students often had to wait for responses and adapt to circumstances. The project required extensive teamwork, which caused frustration at times (e.g., when some members did not deliver elements on time, or correctly, to their teammates), but which served to develop stronger collaboration and leadership skills. These and other factors led the PALs committee to conclude that future projects should include a greater mix of interdisciplinary classes, especially more upper-level classes, so that upper-level students could share the workload as well as mentor first-year students on how to adapt and learn in flexible, team-oriented environments.

The PALs pilot project: Outcomes.

GGC employs a process of structured and ongoing assessment at the course level. Faculty members define and designate student-learning outcomes for each course that demonstrate mastery via assignments, projects, and exams assessed according to established rubrics and criteria. Courses are then evaluated as to the percentage of students achieving individual outcomes and the course outcomes overall. Course assessment reports delineate highlights of a course and indicate both problems and successes in the course based on analysis of student achievement of the outcomes. Reports are used to identify promising approaches and increase program effectiveness.

In the PALs pilot project, analysis of data indicated that students met course outcomes in strong numbers. The course assessment report for Composition I indicated that students in the PALs project class met course outcomes overall at a higher rate than students taught by the same professor in a non-PALs Composition I section using different, more traditional assignments such as multiple formal academic essays based on thematic course readings (90% versus 88%). The comments from PALs project student final reports, reflective essays, and portfolios required as part of the assessment measures were markedly positive. Students highlighted not only the benefits of participating in authentic learning activities but also their achievement of a range of authentic learning goals. Many students noted that the challenges helped them better understand both the content and skills taught in their classes as well as the nature of real business. One student commented,

> I learned so many things that I will certainly take with me to my future jobs. . . . If I were to forget anything from this experience I would never want to forget the relevance that each element of this planning process had on my college education and my future career.

Another remarked that

> It was nice to have a purpose behind my writing assignments other than trying to get a good grade. I feel that I have put more thought and effort into my work this semester than I normally would have in another class. I also feel that I have learned a lot about working as a team, and about my own strengths and shortcomings from this experience.

Another student reflected that

> Every step that we took to host this event has put me that much closer to deciding what I am going to do when I get out of college. I now know that I have the ability to plan long term and have the knowledge that will help me succeed in whatever career I choose.

The strength of the results encouraged the PALs committee to approve a PALs project with a Gwinnett County community partner.

PALs Project #2

GGC's criteria for selecting a community partner include (a) the organization must be supportive of the college and its goals as embodied in PALs projects, and (b) that the organization must be interested in developing long-term educational projects with the college. In spring semester 2009, three classes—a biology, a psychology, and an English class—partnered with Gwinnett Clean & Beautiful to create Talking Trash in Gwinnett, a problem-based PALs project for upper- and lower-level classes tasked with (a) identifying litter issues on the GGC campus, (b) developing and proposing strategies to address the identified litter issues, and (c) educating the GGC campus about litter issues. Members of the PALs steering committee and the PALs project faculty members met multiple times with representatives from Gwinnett Clean & Beautiful to learn which of the organization's goals could be aligned with and supported by GGC goals and stayed in contact with organization representatives via phone and e-mail throughout the duration of the project. Gwinnett Clean & Beautiful identified college-age students as a high-target audience for education regarding litter issues. The executive director of Gwinnett Clean & Beautiful expressed the desire for a project that could both educate students and encourage them to take action to address litter issues. Faculty members proposed the Talking Trash in Gwinnett PALs project, which would integrate activities to meet Gwinnett Clean & Beautiful goals as well as GGC-specific goals, including content, skills, and outcomes. Some 36 students in Composition I, Cognitive Psychology, and Biology Interdisciplinary Applications, a capstone course in biology requiring students to apply biology concepts and core knowledge to current issues, collaborated throughout the semester to develop Talking Trash in Gwinnett. Students used the same types of authentic learning activities as

previously described, as well as various assignment templates and models of student work from the previous semester.

PALs project #2: What the students did.

Students learned about litter issues via multiple guest speakers provided by Gwinnett Clean & Beautiful; multimedia and educational materials supplied by the guest speakers; online resources gathered by all the classes involved; and informational presentations, videos, and research posters produced by the psychology and biology classes. In the junior level cognition class, students designed and created a study that investigated people's attitudes and behaviors toward litter, including individual beliefs about the causes of litter. Students conducted research to determine the most appropriate methodology to use *(Greenwald, McGhee, & Schwartz, 1998)*, wrote and submitted an IRB proposal, received approval, and collected data from the campus body. The biology students conducted brainstorming sessions with Gwinnett Clean & Beautiful's education coordinator to develop ideas for K-12 classroom projects and demonstrations. They also worked with her to host demonstrations on the GGC campus using an interactive environscape (a 3-D model of a city and suburb) showing the effects of litter that can flow into the waterways during rain, lawn watering, and activities such as car washing. Students conducted the demonstrations, then took questions from the audiences and discussed their research findings regarding the environmental impacts of litter. Both the biology and the psychology class developed short videos and informational posters illustrating aspects of litter problems. The English class handled all the communications components of the project.

Addressing course schedule issues.

Because the classes met at different times, professors made innovative use of technology to allow everyone asynchronous access to shared materials. While the synergy that developed among the classes differed from face-to-face interaction, it allowed for a wider range of activities. What might have been a problem instead became a way for students to learn effective use of technology. With the assistance of the Office of Educational Technology, guest speakers presented in specially equipped classrooms that captured speaker and student interaction, video and voice, for subsequent viewing by other classes. The Office of Educational Technology also set up a cooperative course on BlackBoard, an online course management system used in all classes at the college, for the PALs

litter project in which all the students from the three courses were enrolled. The site served as a central location for links to research materials, presentations, videos of guest speakers, and group discussion boards, as well as student-produced materials such as proposals. Students used the site to learn about litter issues asynchronously, access shared materials, set up face-to-face meetings among teams, and collaborate and craft arguments, proposals, and educational products.

PALs litter project: Authentic learning activities.

Students identified litter issues on campus and researched the negative results of litter as well as the decision-making processes that lead people to litter. Using these materials, they devised creative solutions to address the litter problem on campus. With the help of professors and community partners, the students educated each other and then crafted formal proposals and pitches to implement their ideas on campus. The products they developed drew upon a variety of media to make their case and included ideas for an educational campaign to change campus culture and attitudes about litter while also addressing key factors that contribute to litter, such as absence of trash cans and ash bins for cigarette butts. As the semester drew to a close, students presented their work and participated in a campus festival hosted by the School of Science and Technology, where they displayed campaign elements and research posters they had created, and teamed with members of Gwinnett Clean & Beautiful to serve at interactive, hands-on displays designed to educate the campus about the effects of litter.

PALs project #2: Outcomes.

As with the previous endeavor, data collected from course assessment reports indicate that students in the second PALs project successfully met course and college outcomes, and in this project, also supported Gwinnett Clean & Beautiful's goal of educating and engaging college students. Students responded positively to the learning experience in reflective essays, final reports, and portfolios. Students in the biology class indicated on their student evaluations that, because it was derived from their personal experiences and enhanced the connection between their coursework and applications of course content and outcomes to real-life situations, the PALs project was more meaningful to them than other topics they studied. For example, when asked to rate the topics that were most useful to them, students rated the

Talking Trash in Gwinnett project 4.7 on a scale of 5, whereas a more theoretical project undertaken assessing the feasibility of a wind farm on the local coastal plain scored 3.2, even though it was a student-selected project. The PALs project also directly addressed two individual course outcomes for Biology Interdisciplinary Applications requiring students to "apply biological principles and information to real world issues" and "effectively and clearly communicate scientific information in written and oral form" *(Georgia Gwinnett College, 2009a)*. Through the PALs litter project, 88% of students in the biology class achieved these course outcomes. In the Composition I class, the project addressed several individual course outcomes leading to an overarching goal of effective written and oral communication in a variety of mediums and with multiple audiences. Students ultimately demonstrated proficiency via a portfolio, and 94% of students met the course outcomes. In the PALs Cognitive Psychology class, 100% of the students enrolled met the course's outcome requiring them to "demonstrate the ability to apply psychological theory and/or research methodology to real world, culturally diverse situations, apply the appropriate statistical tools, and abide by ethical foundations" *(Georgia Gwinnett College, 2009b)*.

PALs Project #3

Fall semester 2009, the PALs committee and Gwinnett Clean & Beautiful decided to again collaborate while significantly expanding participation in the project. The PALs project, Every Litter Bit Hurts, included representatives from Gwinnett Clean & Beautiful, faculty members, and students from upper- and lower-level composition, biology, psychology, math, digital media, and first-year experience courses for a total of seven courses with 168 students involved. Project goals were also expanded to meet Gwinnett Clean & Beautiful's desire to encourage student volunteerism with the organization.

PALs project #3: What the students did.

Participating faculty members followed previously established practices, and students assessed the solutions that were proposed and the materials that were produced during spring semester 2008. Students added new research, including field research and surveys for which they sought and received IRB approval, and contributed discipline-specific skills and content from their respective classes to improve and extend the antilittering campaign. They also participated in an off-campus community litter clean-up project

sponsored by Gwinnett Clean & Beautiful. The students ultimately proposed and developed a complete antilittering campaign with marketing slogans and tag lines; multimedia graphics, logos, and posters; and educational and persuasive animations, commercials, and video presentations to be played on the campus plasma screens or in classes.

PALs project #3: Outcomes.

Course assessment reports indicate that 91% of students in the PALs Composition I class met overall course outcomes, compared to 86% of students taught by the same professor in a non-PALs class. Similarly, 85% of students in the PALs psychology course Introductory Cognition and Learning met a specific course outcome requiring them to effectively relate course concepts to real-world situations, compared to only 70% of students in a non-PALs section of the same course. In the biology classes, the project addressed outcomes requiring students to "effectively collect and analyze data and draw conclusions," and "apply scientific concepts to global issues and perspectives and distinguish between well-documented scientific studies and popular opinion" *(Georgia Gwinnett College, 2009c)*. In the PALs biology classes, 95% of students met the first outcome and 86% met the second outcome, compared to 84% and 75%, respectively, of students enrolled in the same biology course overall (PALs and non-PALs). Students also gave the project high marks for its engaging nature, relevance, and usefulness. One student summed up the experience by writing, "Developing a litter campaign was a good vehicle to deliver the lessons in the course. All the lessons were salient and will be (and have been) useful for the rest of my life. A bonus is that we have made a difference in the litter problem on GGC's campus."

Finally, Connie Wiggins, executive director of Gwinnett Clean & Beautiful, has noted that the PALs projects have resulted in faculty and students "having a better understanding of the issue of littering and its impacts on their community and school environment" and "a greater appreciation for the complexities of littering" while "engaging in addressing this issue," and she looks forward to a continued and long-term partnership *(personal communication, September 2009)*.

The PALs Program: Challenges and Next Steps

Throughout the process of implementing and expanding the PALs projects program, participants (GGC faculty, staff, students, and community) have faced practical challenges. The PALs

committee, however, discovered ways to turn challenges into problem-based learning opportunities.

Challenge One: Workload

The workload required in PALs projects is significant for both faculty members and students. Initially, there appeared to be danger of burnout for both the students and the professors. Time often became a key factor. Student tendencies to procrastinate created too much work at the end of the semester, when other classes required much time as well, and by semester's end, some students had grown weary of working on the same projects throughout the semester. One solution to these problems was to redesign the project, front-loading research and significant writing assignments so that the majority of the coursework was completed no later than two weeks before the end-of-semester's culminating event. The faculty members and students ensured that the work was completed on time by crafting clear work plans, setting firm deadlines for student work, and emphasizing that those deadlines were set in order to deliver products to the public, thereby placing work in the context of business stakes rather than classroom stakes. Framing student work in this fashion yielded better results, as shown in the third term of the PALs project.

Another solution to address workload was to involve multiple courses in a single project. Dividing the work across more courses, so that each class could focus on one area of expertise or mastery while still coordinating with others to share information, made it possible to reduce large tasks to more manageable size. In addition, this addressed professors' concerns about simultaneously participating in PALs while covering course content and teaching other courses. The members of the PALs committee learned that the time constraints of a single semester and content-knowledge demands in disciplines like biology and psychology meant that some courses could not focus too heavily on a PALs project. Instead, PALs projects functioned more effectively in those courses when activities or products represented a discrete piece, or only a few pieces, of the overall project and course. Discrete yet interconnected and project-integrated activities generated good results. The PALs program now outlines that PALs projects can be big or small. A course can make an important contribution to a PALs project even when only one assignment contributes to the whole.

A third way to address workload is to adapt templates and educational materials designed during previous PALs projects. This

repurposing made some components of course preparation and execution easier for faculty members. It had the added benefit of creating connections among new and returning students while also providing new students with peer models. For example, by continuing the partnership with Clean & Beautiful in subsequent PALs projects, students could become part of an ongoing community project and learn from those who had participated in the process before them. The continuing partnership allowed GGC to develop a stronger relationship with Gwinnett Clean & Beautiful.

Challenge Two: Assessment

Quantitative assessment of the impact of PALs projects has proven to be a challenge because of the decision to deploy initial PALs projects on a limited scale. The PALs program developers have focused on ensuring that the PALs model is a strong educational approach for students and faculty and that PALs projects can be effectively managed across the college. This approach allows for incremental improvements each semester and has helped GGC cultivate a long-term collaboration with a community partner. The carefully controlled scope of the first three projects, however, has yielded a small sample size of student reflective responses or learning-outcome data points. Preliminary data is encouraging and warrants more analysis, but commitment to the PALs model will also entail a commitment to long-term evaluation of the program on all levels as it grows. A next step is to develop a robust evaluation that measures the impact of the PALs program on the community partners, on the participating students (academic, personal growth, and civic responsibility outcomes), on the participating faculty members, and on GGC as a whole.

While assessment is still in the early stages and ongoing, the authors are developing multiple measures for structured evaluation, such as pre- and postproject surveys, that will include not only faculty, staff, and students at GGC, but also community partners. This is an area for continued development. Initial results, however, indicate that PALs will fulfill the promise of authentic learning and can aid students in their acquisition of important learning outcomes.

Sustaining and Expanding the PALs Program

GGC continues to refine the PALs program to improve course design and project planning and to identify best practices while also expanding the program's reach. In spring 2010, GGC created

an Office of Service Learning, Active Citizenship and Community Engagement. The PALs program is working with the office's staff to identify needs in the broader community and form new relationships. The PALs program leaders also are promoting PALs across the GGC campus and beyond via workshops, presentations, and a public website (http://wiki.ggc.usg.edu/mediawiki/index.php/PALs) containing action plans, templates, and forms for use in PALs project planning and implementation.

Conclusion

Using Georgia Gwinnett College templates and sample guidelines for its Partners in Active Learning program, interested readers can develop their own flexible and sustainable organizational structure for PALs programs. They can design policies and procedures to support, manage, and scale up a similar program; identify incentives that attract faculty, students, staff, and community organizations to collaborative projects; and create promotional materials, Frequently Asked Question sheets, project proposal templates, and approval forms to educate people about PALs.

A PALs program supports a college culture for the 21st century. PALs projects help students take an active role in understanding the issues that concern their community and form relationships between the college and the surrounding community. They enable faculty members to engage in interdisciplinary, student-centered learning that builds ties among a range of courses and disciplines; expose students to critical thinking and enriched, problem-based learning by encouraging them to explore the complexity of current issues and asking them to develop and implement plans to address these issues; and provide students the opportunity to develop a range of skills by helping community organizations and showcasing their creative endeavors in public venues.

"PALs projects help students take an active role in understanding the issues that concern their community and form relationships between the college and the surrounding community."

Partners in Active Learning programs foster the time-honored goals of higher education while moving beyond the traditional confines of the classroom, using the kinds of high-impact

educational practices necessary for students to acquire the intellectual and practical skills employers are looking for and communities need. They do this by incorporating integrative learning across the higher education institution and within the broader community. By working with community organizations, the students, faculty, and staff from all levels of a higher education institution can pool resources, knowledge, and skills to create interdisciplinary, collaborative endeavors that develop richer educational environments and encourage students to become contributing citizens today and active leaders tomorrow.

References

About GGC. (n.d.). Retrieved May 29, 2010, from http://www.ggc.edu/about-ggc

Alessi, S. (1988). Fidelity in the design of instructional simulations. *Journal of Computer-Based Instruction*, *15*(2), 40–47.

Ames, C. (1992). Classrooms: Goals, structures, and student motivation. *Journal of Educational Psychology, 84*, 261–271.

Armstrong, E. G. (1997). *The challenge of problem based learning* (2nd ed.). London, United Kingdom: Kogan Page.

Association of American Colleges and Universities. (2002). *Greater expectations: A new vision for learning as a nation goes to college*. Retrieved from http://www.greaterexpectations.org/

Association of American Colleges and Universities. (2007). *College learning for the new global century* (2007 LEAP report). Retrieved from http://www.aacu.org/leap/

Association of American Colleges and Universities. (2008). *College learning for the new global century* (2008 LEAP report). Retrieved from http://www.aacu.org/leap/

Association of American Colleges and Universities. (2010, May). *Dickinson College: Four years as a demonstration* site. Retrieved from http://www.aacu.org/bringing_theory/newsletter/may10/campushighlight.cfm?utm_source=news&utm_medium=blast&utm_campaign=bttopmay10

Blumberg, P. (2000). Evaluating the evidence that problem-based learners are self-directed learners: A review of the literature. In D. H. Evensen and C. E. Hmelo (Eds.), *Problem-based learning: A research perspective on learning interactions* (pp. 199–226). Mahwah, NJ: Lawrence Erlbaum.

Bjork, R. A., & Richardson-Klavhen, A. (1989). On the puzzling relationship between environment context and human memory. In C. Izawa (Ed.), *Current issues in cognitive processes: The Tulane Flowerree Symposium on Cognition* (pp. 313–334). Hillsdale, NJ: Erlbaum.

Bransford, J. D., Brown, A. L., & Cocking, R. R. (2000). *How people learn: Brain, mind, experience, and school*. Washington, DC: National Academy Press.

Craik, F. I. M., & Lockhart, R. S. (1972). Levels of processing: A framework for memory research. *Journal of Verbal Learning and Verbal Behavior*, *11*, 671–684.

Dochy, F., Segers, M., van den Bossche, P., & Gijbels, D. (2003). Effects of problem-based learning: A meta-analysis. *Learning and Instruction*, *13,* 533–568.

Downing, K., Kwong, T., Chan, S., Lam, T., & Downing, W. (2009). Problem-based learning and the development of metacognition. *Higher Education, 57*(5), 609–621.

Duke, J. L. (1999). Service-learning: Taking mathematics into the real world. *The Mathematics Teacher, 92*, 794–799.

Edens, K. (2000). Preparing problem solvers for the 21st century through problem-based learning. *College Teaching, 48*(2), 55–60.

Ewell, P. T. (1997). Organizing for learning: A new imperative. *AAHE Bulletin, 50*(4), 3–6.

Georgia Gwinnett College. (2009a). *Biology Interdisciplinary Applications syllabus.* Lawrenceville, GA.

Georgia Gwinnett College. (2009b). *Cognitive Psychology syllabus*. Lawrenceville, GA.

Georgia Gwinnett College. (2009c). *Biological Sciences I syllabus*. Lawrenceville, GA.

Greenwald, A. G., McGhee, D. E., & Schwartz, J. L. K. (1998). Measuring individual differences in implicit cognition: The implicit association test. *Journal of Personality and Social Psychology, 74*, 1464–1480.

Healy, A., & Sinclair, G. (1996). The long-term retention of training and instruction. In E. L. Bjork and R. A. Bjork (Eds.), *Memory: Handbook of perception and cognition* (pp. 525–564). New York, NY: Academic Press.

Herrington, T., & Herrington, J. (2006). What is an authentic learning environment? In T. Herrington & J. Herrington (Eds.), *Authentic learning environments in higher education* (pp. 1–13). Hershey, PA: Information Science Publishing.

Herrington, J., Oliver, R., & Reeves, T. C. (2003). Patterns of engagement in authentic online learning environments. *Australian Journal of Educational Technology, 19*(1), 59–71. Retrieved from http://www.ascilite.org_au/ajet19/herrington.html

Hmelo, C. E., & Evensen, D. H. (2000). Problem-based learning: Gaining insights on interactions through multiple methods of inquiry. In D. H. Evensen and C. E. Hmelo (Eds.), *Problem-based learning: A research perspective on learning interactions* (pp. 1–18). Mahwah, NJ: Lawrence Erlbaum Associates.

Hmelo, C. E., & Lin, X. (2000). Becoming self-directed learners: Strategy development in problem-based learning. In D. H. Evensen and C. E. Hmelo (Eds.), *Problem-based learning: A research perspective on learning interactions* (pp. 227–250). Mahwah, NJ: Lawrence Erlbaum Associates.

Hmelo-Silver, C. E. (2004). Problem-based learning: What and how do students learn? *Educational Psychology Review*, *16*(3), 235–266.

Institutional Effectiveness. (n.d.). Retrieved August 12, 2010, from http://www.ggc.edu/ie-assessment

Jenkins, H., Clinton, K., Purushotma, R., Robison, A., & Weigel, M. (2006). *Confronting the challenges of participatory culture: Media education for the 21st century* [White paper]. Retrieved September 22, 2010, from http://digitallearning.macfound.org/atf/cf/%7B7E45C7E0-A3E0-4B89-AC9C-E807E1B0AE4E%7D/JENKINS_WHITE_PAPER.PDF

Lieux, E. M. (2001). A skeptic's look at PBL. In B. Duch, S. E. Groh, and D. E. Allen (Eds.), *The power of problem-based learning: A practical "how to" for teaching undergraduate courses in any discipline* (pp. 223–235). Sterling, VA: Stylus Publishing.

Lombardi, M. (2007a). *Approaches that work: How authentic learning is transforming higher education* [White paper]. Retrieved from http://net.educause.edu/ELIResources

Lombardi, M. (2007b). *Authentic learning for the 21st century: An overview* [White paper]. Retrieved from http://net.educause.edu/ELIResources

Merrill, M. D. (2007). First principles of instruction: A synthesis. In R. A. Reiser and J. V. Dempsey (Eds.), *Trends and issues in instructional design and technology* (2nd ed., pp. 62–71). Upper Saddle River, NJ: Merrill/Prentice Hall.

Moore, D. S., Cobb, G. W., & Garfield, J. (1995). Statistics education fin de siècle. *The American Statistician, 49*, 250–260.

National Center on Education and the Economy. (2007). *Tough choice or tough times.* San Francisco, CA: Jossey-Bass.

Pintrich, P. R., & Schunk, D. (1996). *Motivation in education: Theory, research and application.* Columbus, OH: Merrill/Prentice Hall.

Prince, M. (2004). Does active learning work? A review of the research. *Journal of Engineering Education*, *93*(3), 223–231.

Princeton University. (n.d.). *Community based learning initiative*. Retrieved from http://www.princeton.edu/~cbli/

Ramsden, P. (2003). *Learning to teach in higher education* (2nd ed.). London, United Kingdom: Taylor and Francis.

Root, R., & Thorne, T. (2001). Community-based projects in applied statistics: Using service-learning to enhance student understanding. *The American Statistician, 55*(4), 330–335.

Savery, J. R., & Duffy, T. M. (1995). Problem based learning: An instructional model and its constructivist framework. In B. G. Wilson (Ed.), *Constructivist learning environments: Case studies in instructional design* (pp. 135–148). Englewood Cliffs, NJ: Educational Technology.

Siemens, G. (2004). *Connectivism: A learning theory for the digital age* [White paper]. Retrieved from http://www.elearnspace.org/Articles/connectivism.htm

Schwartz, D. L., Lin, X., Brophy, S., & Bransford, J. D. (1999). Towards the development of flexibly adaptive instructional design. In C. M. Reigeluth (Ed.), *Instructional-design theories and models: A new paradigm of instructional theory* (Vol. 2, pp. 183–213). Mahwah, NJ: Erlbaum.

Tashiro, J. S., & Dunlap, D. (2007). The impact of realism on learning engagement in educational games. In *Proceedings of the 2007 Conference on Future Play* (pp. 113–120). New York, NY: ACM.

U.S. Department of Education. (2006). *A test of leadership: Charting the future of U.S. higher education. A report of the commission appointed by secretary of education Margaret Spellings* (Contract No. ED-06-C0-0013). Retrieved from http://www.ed.gov/about/bdscomm/list/hiedfuture/reports/final-report.pdf

Wason, P. C., & Johnson-Laird, P. N. (1972). *Psychology and reasoning: Structure and content.* Cambridge, MA: Harvard University Press.

Windham, C. (2007). *Why today's students value authentic learning* [White paper]. Retrieved from http://net.educause.edu/ir/library/pdf/ELI3017.pdf

About the Authors

Thomas Hancock earned an M.A. in experimental psychology from Central Michigan University and a Ph.D. in cognitive/experimental psychology from the University of Georgia. He is currently an assistant professor of psychology at the University of Central Oklahoma. During his tenure at Georgia Gwinnett College from 2006 to 2010, Hancock was a member of the PALs steering committee and participated in two PALs projects.

Stella Smith has been teaching at the college level for over 20 years. She has received college, state, and national awards for her innovative teaching approaches. She earned a Ph.D. in instructional technology from Georgia State University. She is currently director of the Center for Teaching Excellence at Georgia Gwinnett College. She is a member of the PALs steering committee.

Candace Timpte earned her Ph.D. in biochemistry from Duke University. She is an associate professor in the School of Science and Technology at Georgia Gwinnett College, is a member of the PALs steering committee, and has participated in three PALs projects to date.

Jennifer Wunder earned a Ph.D. in English from Georgia State University. She teaches undergraduate composition, creative writing, and literature. She is an assistant professor of English at Georgia Gwinnett College, is a former member of the PALs steering committee, and has participated in three PALs projects to date.