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For years, honors programs and colleges have experienced well-documented difficulties in justifying and defending their budgets (and in some cases their existence). These challenges—some of which are discussed in the 2006 *JNCHC* "Forum on Honors Administration" and the 2009 *JNCHC* "Forum on Social Class and Honors"—have ranged from the philosophical ("honors programs are elitist") to the pragmatic ("we have to take care of our own students first, so we can't spare any faculty for an honors class"). Honors administrators have therefore developed an extensive and effective litany of benefits that emphasize how honors programs enhance the student experience, the health of the university, and the good of the community. Honors administrators highlight the role of honors education in student development and curricular innovation; we trot out statistics regarding the positive impact of honors on recruitment and retention; and we show what good citizens our students are, how they engage and serve the larger community.

Some remain unconvinced, however. In good years these doubts can handicap honors programs in their struggle with other units for adequate funding, and in lean times, as universities seek to protect their "academic core" with fewer resources and staff, these familiar criticisms can be crippling. To better insulate themselves as well as to better fulfill familiar mandates, honors programs must continually strive to place themselves at the core of the university's mission, not only as that mission relates to the development of the university itself but also as it relates to the university's commitments to state and regional initiatives. What follows is how the honors program at Louisiana Tech University sought to position itself to participate in a state and regional initiative to develop an area that is ideally suited to the strengths of honors education: the emerging field of cyberspace (see the 2009 *JNCHC* "Forum on Honors

in the Digital Age"). In initiating studies in cyberspace, the honors program drew on traditional strengths of honors education but also charted some new venues for exploration that might be of use to other programs and colleges.

CYBERSPACE: THE "BIG PICTURE" AND THE REGIONAL PICTURE

With a sweeping impact that cuts across virtually all fields, cyberspace is a natural fit for the interdisciplinary focus of honors education. Cybertechnology has permeated all aspects of our world, affecting how we access information, communicate ideas, interact with one another and the larger society, and carry out economic activities. As the world has become more connected, it has also become more vulnerable. Policymakers have scrambled for ways to define, articulate, and defend this new medium. In 2006, the Department of Defense's doctrine entitled *The National Military Strategy for Cyberspace Operations* defined cyberspace as "a domain characterized by the use of *electronics* and the *electromagnetic spectrum* to store, modify, and exchange data via *networked* systems and associated physical infrastructures" (11). The scope of this expansive definition brings all manner of electronic devices into the realm of cyberspace and challenges policymakers, scientists, and educators to wrestle with both the STEM (Science, Technology, Engineering, and Mathematics) and traditionally "soft" (humanities and social sciences) aspects of this emerging field of study. Although initially slow to respond, academia has begun to realize the need for programs and scholars that can bridge traditional disciplines and approach the problems of cyberspace from a multidisciplinary and holistic perspective.

This emerging area of need became critically important in northern Louisiana in 2007, when the Air Force announced its decision to locate its provisional Cyber Command at Barksdale Air Force Base in the metropolitan area of Shreveport-Bossier City, La. After the announcement, local governmental and university leaders began working on initiatives to develop a regional workforce to support the work of the military in defending the nation's cyber infrastructure. As part of this initiative, the state of Louisiana and the municipality of Bossier City put up $100 million toward construction of a secure facility for the newly-established Cyber Innovation Center (CIC). Understanding the role of K–20 education in affecting the kind of systemic change necessary to develop the appropriate workforce, the CIC immediately began work on education outreach. Recognizing that honors, with its historic focus on interdisciplinarity, curricular innovation, and student development, was uniquely poised to make a significant contribution to shaping the contours of teaching and instruction in this emerging field, the director of the university honors program partnered with the CIC and colleagues in the College of Liberal Arts and the College of Engineering and Science to create a multidisciplinary immersion experience for select high school teachers and their students in the area for the summer of 2008. Integrating robotics, cryptography, history, literature, law,

and ethics, the resulting cyber camp introduced some of the brightest students in the region to the many different facets of the cyberworld. In addition to contributing to the collaborative framework and promoting the honors interdisciplinary outlook, the honors program was also affected by the experience: in particular, it was exposed to the possible benefits of participating in teacher professional development.

CYBER DISCOVERY CAMP AND TEACHER PROFESSIONAL DEVELOPMENT

In crafting the Cyber Discovery Camp, the authors followed a model for teacher professional development pioneered by the College of Engineering and Science at Louisiana Tech University and funded by the National Science Foundation. The u-Discovery model develops and deepens partnerships between key feeder high schools and the university in the belief that creating systemic change requires close collaboration between university and high school faculty (Nelson et al.). The overriding philosophy of the u-Discovery model is that cultivating high school teachers and providing them with the skills, knowledge, and resources to implement the subject matter in their classrooms will provide the necessary basis for systemic improvement in selected educational areas. In that sense, the high school teachers, and not the high school students, are the real targets of the initiative. To foster and strengthen the right kind of collaborative relationships necessary for long-term success, a series of required teacher workshops are held before each camp. Led by the university faculty team, the teacher workshops walk the faculty through some of the projects and assignments that will be utilized in the camp. In this way, high school faculty are incorporated as part of the team and empowered to take an active role in the education of their students. The feedback of the teachers in these workshops mirrors that of honors students in experimental honors courses: their comments make the instructors aware of what pedagogical and curricular innovations are likely to be successful in the long term.

The Cyber Discovery Camp departed from the u-Discovery model in two significant ways, allowing a greater role and impact for the honors program. The first is that the Cyber Discovery Camp, owing to its subject matter, promotes greater interdisciplinarity than the traditional u-Discovery model, which is focused on STEM disciplines, particularly engineering. The Cyber Discovery Camp incorporates disciplines from STEM and the liberal arts, thus allowing for a greater range and number of teachers in traditional honors disciplines to be involved. The second is that the Cyber Discovery Camp targets a different population of students than the traditional u-Discovery model. Funded by the NSF, TechSTEP, the initial iteration of the u-Discovery model, was animated by an explicit desire to recruit and retain more students into STEM disciplines; in the Freshman Enrichment Project (FrEP) portion of the program, this involves enrolling interested but at-risk students in a set of summer courses to prepare them for the freshman curriculum (Crittenden et al.). By contrast, the Cyber

Discovery Camp was aimed squarely at high-achieving students, precisely the kind of students that go on to honors programs and colleges in universities. Teachers from participating schools were asked to select students who had shown an aptitude for math/science or the humanities (with a rough balance of students between the two disciplines). By working with high school faculty who teach high-achieving students across a range of disciplines, the Cyber Discovery Camp helped directly recruit potential honors students that participated in the camp *and* created a recruiting pipeline through the participating teachers of other high ability students. Moreover, the expansion of the model to include non-STEM disciplines enabled the liberal arts faculty to address long-standing stereotypes about the institution and highlight programs in the liberal arts for participating high school students and faculty.

The Cyber Discovery Camp was a total-immersion experience for teachers and their student teams. This camp integrated numerous interdisciplinary experiences as well as week-long challenges involving specific disciplines such as engineering, computer science, mathematics (cryptography), literature, history, and political science. The camp used multi-media formats such as movies, lectures, hands-on tasks, and writing assignments. The students and teachers lived on campus for the entire week. Their housing and meals were provided, and activities were scheduled from 8:00am until 11:00pm in such a way that teams relied on the different strengths of the various members to complete the intense challenges of a given day. The camp organizers divided a typical day at the camp into different topics and incorporated various means of group interaction, including sessions that involved the entire camp group, sessions where the schools worked independently as a group, and sessions with mixed small groups where individuals were randomly assigned to help create new, diverse interactions (see Tims et al.).

By participating in the organization and execution of the camp, the honors program at Louisiana Tech helped re-create the honors collegiate environment in a compact and intense camp for rising high school sophomores of high ability. In the process, it helped foster interdisciplinarity and collaboration among high school and college faculty. The experience proved so successful that the faculty team decided to try the same curriculum as a highly interdisciplinary honors course.

CAMP CURRICULUM AS AN HONORS COURSE

On the heels of the success of the first Cyber Discovery Camp in the summer of 2008, the interdisciplinary faculty team responsible for its creation and implementation agreed to test the camp curriculum in an upper-division honors course. Mapping essentially the same subjects and projects covered in the camp over the course of a one-term honors class (with a deeper exploration of the issues appropriate for a college-level honors course), "Studies in Cyberspace" was offered in the winter quarter of 2009 as an upper-division, cross-listed honors course. The authors wanted to see if the same interdisciplinary approach that

was so successful in a compact, intense week-long experience for rising high school sophomores could translate into an eleven-week course for college juniors and seniors. The authors also wanted to find out if this basic approach could serve as the basis for an interdisciplinary minor in cyberspace and then perhaps as the foundation for undergraduate programs in cyberspace engineering and graduate programs in cyberspace studies.

Overall, the course was a major success. The course attracted significant student attention: sixteen students enrolled in the course from a range of majors, including engineering, computer science, communication design, political science, business, literature, and biology. Involving eleven professors from six different disciplines, the course also received statewide attention for its innovative approach to the promises and problems posed by cyberspace. Moreover, the course received national attention when the honors director was able to secure a field trip for the students to the Air Force Cyber Command Provisional at Barksdale Air Force in Bossier City, La. (for the story see <http://www.af.mil/news/story.asp?id=123148696>). This interaction provided a real-life context for the course content. Students and faculty had the opportunity to interact with members of the Air Force who are focused on defending the nation's cyber infrastructure. Finally, the course did an admirable job of familiarizing participating faculty with the honors program itself—its governing philosophy, its institutional challenges, and its potential in facilitating like-minded endeavors in the future.

The integration of topics across the disciplines was achieved by carefully selecting the right liberal arts themes, assignments, and case studies to integrate with the computer science, engineering, and mathematics subjects. Below are summaries of the major areas interwoven throughout the course:

HANDS-ON-LAB, BOE-BOT

The faculty employed the Boe-Bot robotic platform used in the freshmen engineering integrated curriculum. The hands-on robotic activities provided a visceral way of demonstrating vulnerabilities in coding and wireless transmission. The course developers recognized that not all students had been exposed to programming topics in their traditional curriculum. It was critical that the Boe-Bot activities be appropriately cast so that it exposed non-STEM majors to new concepts and expanded the capabilities of STEM students. The use of a robotic platform served as a mechanism for teaching problem solving and provided a context for other activities in the course. The robots also provided the unifying construct for the competition at the end of the term.

CYBER POLICY AND ETHICS

Students were presented with ethical issues from historical and philosophical positions. Faculty encouraged students to critically examine their engagement with information technology and assess its impact both on classical ideas of democracy and American democracy in particular. Students were also

exposed to the historical use of information technologies in domestic and international politics as well as the dangers that their use posed to various historical actors. Students were encouraged to discern and apply "lessons of history" to contemporary situations today.

Hands-On-Lab, Cryptography

After presenting a historical perspective on the use and development of cryptography, faculty from the computer science and mathematics departments led discussions on issues in cryptography. Starting by posing the simple question "Can we share information without revealing information?" taken from Computer Science Unplugged (Bell et al.), a series of hands-on activities in computer science designed for pre-college students, we explored deeper more advanced topics in cryptography. Using material from classic upper-level number theory books, students were exposed to some of the key theory behind modern-day cryptosystems. Topics included modulo-arithmetic (a cornerstone of all cryptography), one-way hash functions, shared-key systems, public-private key systems, certificate authorities, and man-in-the-middle attacks. Several of these topics use very high-level mathematics, beyond the pre-requisites for the course. However, the complexity generally lies in the proofs of correctness. Rather than concentrate on the complete details of the proofs, we focused on presenting the students with the actual cryptographic methods used and the general arguments for their correctness. These sessions exposed students not only to cryptographic and code-breaking techniques but also to the mathematics and logic behind the techniques employed. Showcasing the mathematics behind modern cryptographic systems allows students to understand that we are only as safe in our online world as the state of knowledge in solving sophisticated mathematical problems.

Culture

The students read William Gibson's *Neuromancer* and issues of the *Machine Man* comic book. They also watched the films *Sneakers* and *The Matrix*. Finally, they created avatars on Second Life. Throughout the discussions of these cultural artifacts, students wrestled with what it means to live in a "cyber culture." In particular, they addressed the problems posed by the fictional works and whether or not these concerns have proven valid or would prove valid in the future.

Hands-On-Lab, Architecture

Another aspect of cyber security relates to the physical structures that humans create. An architecture faculty member developed and presented material that showcased the need, vulnerability, and design of structures related to cyberspace. In particular, students considered how the digital environment constitutes a new "built" environment and what impact this new cyber

infrastructure might have on new and existing buildings. Student teams also designed "secure" buildings that would be used in the final Cyber Challenge; this required students to anticipate how their designs were vulnerable to attacks. Students designed their Cyber Challenge bases using 3-D modeling software (Sketch-Up) and constructed them based on these designs.

CYBER CHALLENGE

The final class in the course included what was called a "Cyber Challenge," a robotics competition based on the engineering and computer science platform used during the course, in which students incorporated various aspects of the activities from class. For example, students used the "secure" building from the architecture hands-on-lab in protecting and defending their base during the final challenge. Additionally, students expanded the hands-on Boe-Bot activities to meet their individual team needs. All the teams used wireless communication, and some of them expanded the capability of their system by adding game controllers for easier maneuverability of the robots.

COURSE ASSESSMENT AND LESSONS LEARNED

At the beginning and end of the term, we surveyed our honors students on a variety of questions regarding their confidence and attitudes in areas related to cyberspace. Although the sample size of sixteen students is too small to be statistically significant, the results are promising, and if we can convince other universities to adopt similar interdisciplinary courses more reliable results might be forthcoming. The questions posed can be grouped into two broad areas: STEM-related topics mainly focused on cryptography and robotics and the more liberal-arts-related topics dealing with ethics, politics, and culture. The response options were *confident, somewhat confident, neutral, somewhat not confident,* and *not confident.*

In the STEM-related questions, we probed the students on a number of issues. We asked the students to rate their confidence in designing robotic systems to perform tasks controlled by a human user interface. The pre-assessment survey responses showed that 44% of the students felt confident or somewhat confident in the matter. We note that 69% (11 of 16) of the students were engineering and science students while the remaining 5 were either liberal arts or business students. In the post-assessment survey, the positive responses jumped to 85% with only one student responding "somewhat not confident." We posed a similar question regarding confidence in arguing about strengths and weaknesses of simple security protocols. Initially, 19% of the students responded "somewhat confident," 12% were neutral, and 69% responded either "not confident" or "somewhat not confident." After the course, the response rate for "(somewhat) confident" increased to 46% and the "(somewhat) not confident" rate dropped to 31%. The heavier focus on the robotics project particularly at the end of the course most likely explains the stronger improvement in robotics ability versus security.

Though the initial confidence scores were relatively higher, we found similar improvements when assessing student attitudes to the liberal arts aspects of cyberspace. In particular, when asked how confident the students felt about arguing ethical issues involving cyberspace, initially 69% of the students answered "(somewhat) confident" but after the course the "(somewhat) confident" response rate jumped to 100%. Similarly, when students were asked about their confidence in discussing political issues related to cyberspace the response rates for "(somewhat) confident" jumped from 50% to 69%.

Of course, these numbers need to be interpreted carefully. As noted, the sample size is too small with a change of two students causing a 12.5% shift. Also, since these students are honors students, their natural confidence might skew the pre-assessment surveys toward a higher confidence level. Also, although they might have gained a deeper understanding of the topics after the course, their confidence levels might have remain unchanged. We did not ask them either to rate their feelings on how much they learned in the course or to reassess their pre-course confidence using their new understanding of the topics.

Since this was an initial offering of a highly experimental course, the faculty and students expected from the beginning that improvements could (and should) be made, so they were on the lookout for modifications. The survey results as well as feedback from the student participants and faculty instructors provided some interesting lessons of their own.

1. **Managing a course with several instructors requires careful planning.** On several occasions, various instructors placed assignment deadlines near each other, completely overwhelming the students; this happened because not all the instructors were always aware of specific demands placed by others. Making better use of an online course planning site such as Blackboard to track deadlines or requiring all assignments (and deadlines) to go through a single instructor could potentially remove such problems. Fortunately, the small class size and flexibility of the course and instructors meant that, once the students pointed out the conflicts, we were able to adjust the deadlines quickly and to adopt a single instructor as the point of contact.

2. **Integration of topics by the students cannot be assumed.** Integration of the multiple disciplines that relate to issues in cyberspace was a key emphasis of the course and most in need of improvement. Probably several offerings and, ideally, collaborations with other universities will need to occur before clear, successful strategies emerge. In the one-week camp, the integration of the material was far clearer to the students, probably because the camp was completely immersive and cyberspace topics were all that the students thought about for an entire week. Translating that experience to an eleven-week course was not easy; the students had other courses to worry about, and, instead of having a robotics lesson every day (twice a day) as with the camp, they had a robotics lecture roughly every two weeks. Our intent was

to take the successful topic sequence from the camp and expand it over an entire term, but this did not translate as well as we would have liked. In the evaluations, one student summed up the issue nicely: "I think it would help if the classes were somewhat grouped together, so that the students could keep track of what was going on. This really applies to the engineering/robotics and the cryptology sessions more than the other sessions." The notion of grouping the topics was one that we had initially considered and in hindsight might have been a better approach. Essentially, in a future offering, we most likely will offer the robotics session far more frequently in the early stages, perhaps every other lecture, while continuing to integrate the humanities aspects, and then switch to cryptographic sessions in the latter half of the course, again offering them on a more regular basis rather than once every two weeks.

3. **Finding the right number of topics to cover is also important.** Another suggestion students made was that, since the number and variety of topics was overwhelming, the course would be better if offered as two courses. The best suggestion to split the topics into two courses that would have to be taken together so that they could still be integrated. By effectively creating a six-credit course, we would be able to delve more deeply into each subject area and include additional topics. In a quarter system such as ours, students take an average nine credits, so a six-hour course would allow students to focus primarily on our course the entire term, leading to an environment more in line with the camp approach. Unfortunately, this suggestion poses new challenges: students, especially in engineering, find it difficult to fit an elective into their course load, let alone two electives in the same term. Such a requirement would almost guarantee a drop in enrollment due to scheduling issues.

4. **Advertising in order to balance enrollment numbers is essential.** For an honors course, we did not expect nor want a class size that was significantly larger than our sixteen students. However, the background of the students was not as balanced as we would have liked. As mentioned, we had eleven students registered as engineering and science students and five as liberal arts students. Our goal was to have equal portions of both. We attempted to enforce this balance by offering two officially separate (but unofficially identical) sections, one listed under Engineering and the other under Liberal Arts. A cap of ten students in both sections would have created a perfect balance. However, not enough students registered for the latter. We feel that we would have achieved a closer balance if we had done a better job of advertising the course to the liberal arts honors students and stressing the liberal arts content of the course. As this was the first offering of the course, advertising essentially was the main venue for recruitment; offering the course again relatively soon could help since word of mouth becomes another good avenue for recruitment.

5. **The payment structure for the course is viable.** The honors program affords prestige to faculty, and we found that faculty would be willing to teach a few classes in a highly experimental course with high-achieving students on a class-by-class basis. We paid each faculty member a modest stipend based on the number of courses that he taught. Together these stipends added up to the equivalent of the normal payment given for one adjunct to teach a class.

LESSONS LEARNED FROM HONORS PARTICIPATION IN THE CYBER INITIATIVE

In addition to the insights gleaned from our assessment of the course itself, the entire experience of participating in a university and regional initiative yielded important conclusions for the honors program, ideas that will help guide future initiatives. We pass them along here in case they may be of use to others.

1. **Honors educators should think more broadly about its use as a laboratory for innovation**. The familiar mantra about the usefulness of honors for trying out new courses was borne out by our experience with our honors class. It allowed us to gauge student and faculty interest and to try out some concepts on talented and flexible students; it also allowed the faculty a great deal of freedom in integrating material. In the course, a class on robotics was followed by a class on culture, which was in turn followed by a class on cryptography. We found that such a concept could have broader applications. For example, we are currently looking at adapting parts of a curriculum that we first tested in a camp for high school sophomores and then adapted to an upper-division honors course for use in community colleges as part of a 2+2+2 arrangement. Such an application suggests that the work we do in honors on curricular design does not have to stay just within our institutions.

2. **Honors can serve as a grant-writing vehicle.** By bringing together faculty from across the campus, the honors program helped establish new partnerships for teaching and research among faculty. Our next stage should be for these multidisciplinary teams to apply for funding through the honors program to give them greater resources for future research and curricular initiatives.

3. **Honors should be involved in professional development.** The teacher workshops are an excellent way to establish relationships with local teachers. These relationships allow honors administrators a way to get a sense of the context and background of local students, to establish a useful dialogue between college and high school faculty, and to gain outstanding opportunities for recruitment.

4. **Honors should be involved in university and regional initiatives.** Perhaps the greatest outcome of our involvement in the cyber initiative was the publicity. While this publicity was no doubt great for the honors program itself, it was perhaps more useful for the region as a whole. Our honors class made a small contribution to demonstrating what our state's institutions of higher education can do to promote research and workforce development in an area of critical need. The more we convince private and governmental employers that we can provide the education and workforce they need, the better off our region and state will be.

FUTURE DIRECTIONS OF THE CYBER INITIATIVE

Although the Air Force Cyber Command was recently downgraded to a numbered air force and relocated to San Antonio, the cyber initiative continues to gain steam through the efforts of local community, military, and university leaders. Barksdale Air Force Base was appointed headquarters of the new Global Strike Command, which will retain a portion of the old Cyber Command, and its leaders continue to work with community and university leaders to develop the kind of workforce necessary to support this industry. The Cyber Innovation Center building is scheduled to be finished by the spring of 2010, and the CIC reports considerable private and government interest in its ultra-secure environment; the Air Force has already contracted to rent out three of its floors. The Cyber Innovation Center also continues to work assiduously to promote greater collaboration between its private, academic, and governmental partners.

Academic outreach also proceeds apace. The authors were awarded a $951,000 Department of Education grant to promote cyber education and awareness in grades K–12. These funds will be used to pay for future iterations of the Cyber Discovery Camp as well as teacher development workshops over the 2009–2010 academic year. The Cyber Innovation Center received an NSF-ATE planning grant to establish a Regional Cyber Education Center, and it has formed a working group (led by the team from Louisiana Tech) to develop curricula that can articulate from high school through community colleges to universities. The honors program received a grant from the Louisiana Board of Regents to host a professional development workshop for university faculty on information literacy in January 2010.

The Louisiana Tech University Honors Program stands in a unique position to contribute to and benefit from these initiatives. As a place historically committed to interdisciplinary collaboration and curricular innovation, the honors program provides an ideal climate for supporting this initiative. But by extending its reach, commitments, and activities beyond the traditional honors setting, the honors program at Louisiana Tech hopes to play a role that will benefit the university, region, and ultimately itself. By involving itself in curricular development at the high school, community college, and university levels, it positions itself to play a major role in shaping the contours of teaching in this new

field, and by playing a significant role in academic outreach and teacher development, it cultivates and deepens relationships with area administrators and teachers, placing it in an advantageous position to recruit high-end students in the region.

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REFERENCES

Bell, Tim, Harold Thimbleby, Mike Fellows, Ian Witten, Neil Koblitz, and M. Powell. "Explaining Cryptographic Ideas to the General Public." *Computers and Education* 40 (2003): 199–215.

Crittenden, Kelly, James Nelson, Galen Turner, and Alicia Boudreaux. "TechSTEP: Louisiana Tech University's STEM Talent Expansion Program." *Proceedings of the 2007 ASEE Annual conference and Exposition* (2007) AC 2007-1232. <http://soa.asee.org/paper/conference/paper-view.cfm?id=4494>. Accessed December 30, 2009.

"Forum on Honors Administration." *Journal of the National Collegiate Honors Council (JNCHC)* 7. 2 (Fall/Winter 2006): 15–60.

"Forum on Honors in the Digital Age." *JNCHC* 10.2 (Fall/Winter 2009): 9–70.

"Forum on Social Class and Honors." *JNCHC* 10.1 (Spring/Summer 2009): 9–73.

The National Military Strategy for Cyberspace Operations (2006). <http://www.dod.mil/pubs/foi/ojcs/07-F-2105doc1.pdf>. Accessed December 30, 2009.

Nelson, Jim, Galen Turner, Kelly Crittenden, and Alicia Boudreaux. "A Model for High-School Teacher Professional Development and Student Learning." *Proceedings of the 2009 ASEE/IEEE Frontiers in Education Conference*. <http://fie-conference.org/fie2009/papers/1284.pdf>. Accessed December 30, 2009.

Tims, Heath, Galen Turner, Christian Duncan, and Brian Etheridge. "Work in Progress—Cyber Discovery Camp—Integrated Approach to Cyber Studies." *Proceedings of the 2009 ASEE/IEEE Frontiers in Education Conference*. <http://fie-conference.org/fie2009/papers/1362.pdf>. Accessed December 30, 2009.

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