Promoting Academic Integrity in Computer Science: A Culture Study

Summary of Original Proposal

Yuqing Melanie Wu - School of Informatics and Computing and Carolyn Calloway-Thomas - Department of Communication and Culture

This two-year long project seeks to investigate underlying causes of academic dishonesty in the Computer Science Program at IUB. Wu and Calloway-Thomas will investigate issues associated with academic dishonesty and determine if those issues are same for international students as they are for their American counterparts. The research will also determine to what extent, if any, cultural factors contribute to the increased incidence of academic dishonesty in IUB’s Computer Science Program, and, more generally, at the graduate level.

Other questions the research intends to address:

- How do innovations in information technology change the landscape of information, resources, and students’ perspectives regarding academic dishonesty?
- How do students’ perceptions and knowledge of technical innovations change the definition of academic dishonesty?
- What teaching and learning strategies can be used to address issues of academic honesty? How successful are these strategies at reducing the number of incidents of academic dishonesty?

To answer these questions, qualitative surveys and interviews will be conducted with two groups of students. One group will be made up of graduate students entering the program in 2013 while the other group will be made up of graduate students already participating in the program. The study will use a series of pre/post questions designed to ascertain what attitudes and expectations students have about educational requirements when they arrive at Indiana University and what rules of appropriate conduct they learn subsequently.

This study consists of two phases that will be conducted in an intertwining and recursive manner throughout 2013 and 2014.
Dear SOTL committee,

Attached please find a proposal for SOTL 2013, from Yuqing Wu and Carolyn Calloway-Thomas. Documents included in this package are:

1. Project description
2. References
3. Project timeline
4. Budget
5. CVs of the PIs
6. Nomination letters from School of Informatics and Computing and Dept. of Communication and Culture.

Thank you for considering our proposal.

Sincerely,

Yuqing Wu
Carolyn Calloway-Thomas
The Background and Problem

“We are having a crisis.”

“What’s wrong with the kids? They are graduate students, for heaven’s sake. They should know better.”

“You know what? It seems that some of them really don’t know what’s the right thing to do. You know I don’t want to go the stereotype route, but does this relate to their cultural background?”

“They can Google it and get everything, whole paragraphs of answers, code, you name it.”

“By the way, how do you define cheating? They are students. Are they supposed to learn how to find resources and use them? We are computer scientists; we share our ideas.”

“Of course, there is Open Source. Even my Ph.D. Students sometimes are confused about how to include them in their theses.”

The above lamentations are from faculty in the School of Informatics and Computing who are trying grapple with a compelling issue that the school is facing: the increasing incidents of academic dishonesty among graduate students in the Computer Science Department at Indiana University Bloomington. In 2011-2012, the department handled 31 cases in 3 courses, and despite faculty efforts in adopting various strategies to curb the trend – such as having an academic seminar during new graduate student orientation emphasizing the student Code of Honor on course web pages – in Fall 2012 alone 25 cases have been reported in 4 courses.

Dean of Students Pete Goldsmith has also reported alarming cases of academic dishonesty among students at IUB (Calloway-Thomas, 2012). Clearly, this is a pedagogical and cultural problem that needs to be addressed, as academic dishonesty can have far-reaching consequences for students in terms of how they learn, their careers, and their reputations. Students’ perceptions of academic dishonesty have been documented in other scientific fields at the undergraduate level (Nelson, 2013).

The principal investigators of the study believe that issues of academic integrity in technology fields may be chiefly influenced by two factors, both of which blur the line when defining cheating for graduate students. First, cultural differences influence what international students believe is acceptable and unacceptable when it comes to using another person’s work, and what constitutes academic integrity. Second, the open source and collaborative world of model information technologies has made it more difficult to determine when it is appropriate to write code on one’s own, even though it would be much more expedient, and in some cases, acceptable, to copy known codes to solve particular problems.
The Impact of Cultural Diversity

Clearly, culture affects the way we perceive the world and how we behave in it, and education – both formal and informal – is also implicated. As such, cultural differences lead to differences in terms of how students learn and behave in the classroom. The way students in one culture learn may not be the way students of a different culture learn (Anderson 2000; Brislin and Yoshida 1996; Cooper and Simonds, 2003; Hurtado, 2002; and Means, 1981). Some students come from collectivist cultures, where the group is emphasized rather than the individual. For example, Mexican children, because their culture emphasizes cooperation, allow others to share their homework or answers. “If a U.S. American student shares his or her homework, he or she is seen as dishonest, perhaps even a cheater!” (Cooper, Calloway-Thomas & Simond, 2007, p. 195).

The Impact of Model Information Technologies

The term digital native refers to the generation that has grown up with electronic devices as their “buddies,” while those who adapt to such technical inventions are called digital immigrants. For digital natives, their entire world has always been digital; there has always been a computer for accessing the Internet, a cell phone for texting a friend, iTunes for downloading songs, and social media for sharing digital photos. We have now reached the point where digital natives are entering graduate school. Soon, they will be members of university faculties nationwide. Against this fluid backdrop, Prensky (2001) argues, “Our students have changed radically. Today’s students are no longer the people our educational system was designed to teach.”

Graduate students in the Department of Computer Science are not ordinary natives, however, who grow up with their eyes glued to the screen and their hands on the mouse. They are trained to do so in an undergraduate program and often spend a few years in industry before attending graduate school. As a consequence, these digital natives are better at finding information and resources that are available on the Web than their counterparts. They know where and how such information comes about, since they are not only consumers, but also the engineers and constructors behind the Web scene. This suggests that these digital natives’ views on information and resources may outdistance the views of their peers in other academic majors. In this sense, studying how Computer Science students collect and utilize information and resources may shed much light on the behaviors of students in other majors in years to come, making the proposed study even more important.

Today the majority of college professors are digital immigrants. Not only are such faculty speaking an outdated language that students find foreign, but faculty are also constantly puzzled by how to judge the behavioral changes they witness as the student population in general shifts from one made up of digital immigrants to one comprised of digital natives.

The Goal

What is driving the huge number of incidents of academic dishonesty at IUB? This study is motivated by our efforts to locate the genesis of this problem and provide pedagogical solutions to it. The purpose of the proposed project is to investigate the educational challenges that all students in the Department of Computer Science confront in trying to make a transition to graduate study at Indiana University and the challenges that both faculty members and students are facing in adjusting to rapid technical innovations.
Our research is designed to promote academic integrity among students in Computer Science, and, by extension, at IUB writ large. If we hope to remain effective teachers, and if we hope to produce students with high academic integrity in their future careers, then we need to understand what is driving the current perceived crisis.

In particular, we seek answers to the following questions:

1. Are the problems of academic dishonesty the same for international students as they are for their American counterparts? If so, to what extent, if any, do cultural factors contribute to the increased incidence of academic dishonesty in the Computer Science program, and, more generally, at the graduate level?
2. Do the innovations in information technology change the landscape of information, resources, and students’ perspectives regarding academic dishonesty? If so, how?
3. How do students’ perceptions and knowledge of technical innovations change the definition of academic dishonesty if any?
4. What teaching and learning strategies can be used to address such challenges? How successful are these strategies at reducing the number of incidents of academic dishonesty?

The Research

A truism in intercultural communication is that what people bring to a cultural exchange will significantly influence their interaction in it. Here, by cultural exchange we refer to a more general concept in which both the geographical differences (e.g., countries of origin) and generational gaps (digital natives vs. digital immigrants) are emphasized.

Since the problem of academic dishonesty among international students appears to be rooted in cultural values and perceptions, we will use the qualitative method (Maxwell, 1996). Porter and Samavor (1991) observe that “what we talk about, how we talk about it, what we see, attend to, or ignore; how we think; and what we think about are influenced by our culture” (p. 21). Typically, a qualitative method is used in addressing pedagogical questions related to understanding underlying factors such as how classes ought to be conducted, how students and teachers ought to interact, and what types of relationships are appropriate for students and teachers (Collier and Power, 1990).

Our sample will include two groups of students and one group of faculty. Student Group 1 will consist of graduate students – males and females, M.S. and Ph.D. – who will matriculate into the Computer Science Program at IUB in Fall 2013. It will be very important to collect online data and conduct interviews at the point of entry by using an anonymous method. We will follow students for two years to see what changes, if any, will occur in their perceptions and academic behavior. In particular, we will observe whether a decrease in the number of “cheating” cases at IUB occurs. For baseline comparison, we will also include a similar number of second and third year students in the study as Student Group 2.

It is also crucial to understand the perceptions and assumptions of faculty members. Hence, we will issue surveys and conduct interviews with a group of faculty members, posing the same set of questions as posed to the student groups but asked from the angle of the instructors. In addition, we will organize forums for faculty to openly discuss their concerns, observations, and options for the issues related to students and the academic integrity incidents in their classes.
The study will use a series of pre-and-post questions, all designed to ascertain what attitudes and expectations students have about educational requirements when they arrive at Indiana University and what rules of appropriate conduct they learn subsequently. The study consists of two phases that will be conducted in an intertwining and recursive manner.

The data collection and analysis phase (Phase I) of the study will involve collecting entry-level data. Sources of data will consist of anonymous questionnaires, including demographic dimensions such as country of origin, educational status of parents, income, and sex. Knowing the answers to such questions should help us understand whether there is a correlation between these factors and students’ academic conduct at IU. Open-ended questions will also be used and will focus on such factors as cultural influences upon the learning process, value systems, what is perceived to be permissible in classroom settings, and what perceptions of technical innovations shape students’ definitions of academic honesty. Moreover, we will also ascertain whether students come from collectivist cultures and whether they privilege noncompetitive, holistic and cooperative learning environments. A keen emphasis will be on the salience and substance of answers that provide clues to relationships that obtain between culture and behavior; in this instance, promoting a culture of integrity at IUB.

As a consequence of our data collection and analysis, it is crucial that we understand whether our approach will have successful pedagogical outcomes and whether we can reduce cases of academic dishonesty among students. In this regard, in the pedagogical intervention phase (Phase II) of the project, we will choose entry-level graduate classes in the Computer Science program to conduct the pedagogical intervention part of the study. The pedagogical classes should feature a mixture of written homework assignments, programming assignments, projects and sit-in (or take-home) examinations, in both individual and group settings. All students in these classes will already have answered the open-ended questions in Phase I of the study. Currently, in the pedagogical phase, we plan to:

1. Provide intensive discussions about academic conduct and student codes of conduct during the new graduate student orientation, including sessions led by experts from the Ethics Office of the Dean of Students.
2. Provide explicit messages on course web pages which link to student codes of conduct.
3. Include explicit and repetitive discussions about academic integrity and intellectual property during lectures, especially before homework assignments, project assignments and examinations are given.

Please note that the interview strategies listed above are based on our current understanding of the problem. We will collect data when students first enter the program (before orientation), post orientation, before the first homework assignments are given, and then at the end of the semester, e.g. after the intervention strategies are implemented for a semester. Following the collection of data, we will analyze all answers to open-ended questions and compare entry-level questionnaire responses to post responses, paying particular attention to whether there are changes in students who receive the intervention treatment as opposed to those who do not receive the treatment; examine student responses to answers regarding their encounters with the landscape of information resources; keenly scrutinize students’ comments regarding academic dishonesty; and look for thematic similarities that reflect general categories, e.g., perceptions of what is permissible in classroom settings. Conceptually, the analysis will involve clustering together qualitatively similar content and ideas for comparison and implicative purposes. This will be done for each of the two groups of students included in the study. We will focus on what themes
and content emerge and whether our findings will shed light on our main concern, which is to promote academic integrity in Computer Science, and, by extension, at Indiana University. Since surprises are always possible, we will also look for subsets of other themes that may emerge from student answers. We will be concerned about the relationships that obtain between meanings, cultural content and behavior. The result of the data analysis of the first year will help us to reflect on the successfulness of the intervention strategies and design new methods to be implemented in the round of research in year two.

The Team

Yuqing Wu is an associate professor of Computer Science in the School of Informatics and Computing. She joined Indiana University in 2004 and takes her educational mission very seriously and continuously consults CITL so that she can improve her teaching. She is also keenly interested in conducting research in teaching. She was the recipient of the Trustees’ Teaching Award in 2010 and 2012. In her current role as the Graduate Director of the Computer Science Program, she considers it her duty to improve understanding between students and faculty with the ultimate goal of improving the quality of education that the department provides. Her research focuses on database and data management. Therefore, not only can she provide an understanding of the field of Computer Science in this project, but can also provide the data management and data analyses that are required.

Carolyn Calloway-Thomas is president of the World Communication Association and professor of Communication and Culture at Indiana University. She is author of *Empathy in the Global World: An Intercultural Perspective* (2010), coauthor of *Intercultural Communication: A Text/Reader* (2007), *Intercultural Communication: Roots and Routes* (1999), and coeditor of *Dr. Martin Luther King, Jr. and the Sermonic Powers of Public Discourse* (1993). Her teaching and research areas are intercultural communication, empathy and conflict, communication in Black America, and pedagogy and civic engagement. Her awards include a Fulbright Scholarship to Nigeria, West Africa, a Carnegie scholarship, and the National Communication Association’s Robert J. Kibler Award for excellence and commitment to diversity. Together, Calloway-Thomas’s research and keen involvement with intercultural communication issues at the national and international levels make her suitable for such research. She has given hundreds of speeches and talks nationwide and in such international locations as Australia, Barbados, Colombia, Costa Rica, England, Finland, Ireland, Japan, Latvia, Lithuania, Mexico, Peru, South Africa, and South Korea. Recently, she was invited to give the keynote speech at the Chinese Association for Intercultural Communication (CAFIC) International Conference, which will be held in Hainan Island in November 2013.

The PIs have established collaboration with the consultants of CITL and will continue to work with them in this project.

The Impact

The proposed project focuses on an upcoming and urgent issue faced by educators in institutions of higher education, independent of university and major, triggered by the rapid technological development and the ever-diversified student (and faculty) populations. We believe that our research findings will benefit not only faculty and students in the Computer Science program, but the landscape of education in general at IU and at the national level as well.
References:


Yifat Ben-David Kolikant (2010). *Digital natives, better learners? Students' beliefs about how the Internet influenced their ability to learn.* Computers in Human Behavior 26(6): 1384-1391

### Timeline

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<th>Round I</th>
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<td>Design questionnaires, interview questions and intervention strategies. Recruit faculty to participate in this research.</td>
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<td>Fall 2013</td>
<td>Phase I: survey, interview and data collection</td>
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<td>Phase II: Apply intervention measurements in selected classes; collect data</td>
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<td>Spring 2014</td>
<td>Analyze data</td>
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<td>Compose and publish our results</td>
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<td>Round II</td>
<td>Revise intervention strategies</td>
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<td>Summer 2014</td>
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<td>Phase II: Apply intervention measurements in selected classes; collect data</td>
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<td>Compose and publish our results</td>
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<td>Spring/summer 2015</td>
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### Budget

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