Teaching Portfolio

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Teaching Philosophy Statement

It will be beyond rationality if one assumes that a college program in computer science should equip its students with all the skills and knowledge they would need when they get fully installed in their professional positions. It is true that what we teach our students to share many basic concepts, platforms, and structures with what they will be demanded to struggle with in the future. Still, a syllabus designed out of professional responsibility needs to be concerned with what a program doesn't directly teach. It is a naked reality that on many occasions when I am teaching a language, for example, my students, who are madly excited by the fast paces of the technology of the day, know that they may never code in that language during their professional lives. How I shall keep frustration away from my classroom and how I shall address what I do not teach my students will be among the biggest challenges in my teaching career. These concerns encourage me to look at the content of my teaching as a context that should be provided to equip my students with learning skills that are specifically required in order to deal with emerging computer tools and methods. I found inductive teaching approaches highly contributing to this cause. In this method, students are not merely expected to reduce abstract concepts to specific scenarios, and feed general paradigms to solve individual problems, instead, they will be led to perturb and manipulate tools and structures in order to explore their anatomy and generalize the concepts they are informed by. The advantage of this mode of training makes itself felt when students face unfamiliar tools, software, or languages. In such situations, students trained to apply an inductive approach will deal with unfamiliar items like an aggressive biologist facing a newly discovered species rather than a grammarian transfixed by a completely foreign language.

I believe such an inductive teaching method cannot be efficiently employed unless instructors expose their students to "the-big-picture" on various levels. On the one hand, students need to clearly see where the contents of my courses stand in the technical structure of the educational and academic track they have planned to pursue, and on the other hand, they should have a view of the place of what they learn against the larger background of the reality of the world of research, industry, and administration. The latter is particularly crucial in the course of an inductive teaching method, where the wide potentiality of explorative orientations needs to be restricted by the actual reality of the field.

Applying the technique that I would like to call "reverse-problem-solving" I introduce more creativity and realism to my classroom. This means that my syllabus won't be merely concerned with offering hypothetical scenarios and problems to display a task-oriented approach to the applicable aspects and details of the content of my courses, but in addition, I undertake to heavily motivate students to find or create applications for the skills they obtain in my classroom and defend the relative advantage of using those skills to solve the problems they have suggested. Struggling with reverse-problem-solving offers me an ideal opportunity to encourage my students to explore the realistic research and industrial picture within whose frame the contents of my course should be interpreted.

Instructors need to acknowledge the fact that their students are coming from different educational backgrounds, will pursue different educational tracks, and finally will end up performing different professional tasks. In order to respond to these facts, I will try to increase the multi-dimensionality of my syllabus. It will be particularly addressed

by designing alternative tracks regarding assignments, lab activities, and research projects. However, the logical structure of these tracks, the pre-requirements for each track, and the specific pieces of the big-picture emphasized and addressed by each track should be clearly explained to students. In other words, students should be aware of what they gain or lose substituting an assignment with another one.

My evaluation method won't be designed only to measure and appreciate successful performances. It should also emphasize the value of well-planned but failed attempts. Students, staying away from the swamps of idealism and cliffs of perfectionism, should learn that a failed project is often better than no-project. "Get Your Hands Dirty" will be the motto of my classrooms.

Students need to be convinced that isolation doesn't take their projects anywhere. In this regard, the efficient manner of technical and professional communication, especially in terms of participating in the currents of technical conversations, will be stressed. Where to look for information and solutions, how to formulate questions and inquiries, how to anticipate proper keywords, and how to weigh various received suggestions will be some of the challenges I will constantly engage my students with. They will be pushed to discover the economy of information trade in their field of interest.

All the above can be encapsulated by six key-concepts that comprise the contrastive features of my teaching philosophy: inductive learning method, big-picture, reverse-problem-solving, alternative learning tracks, getting hands dirty, and efficient communication.

Description of Courses Taught

I was an instructor and a teaching assistant for the following courses:

CSCI 4780/6780 (@UGA): Distributed Computing Systems

Role/Semesters: Graduate Teaching Assistant / Spring 2015, Spring 2014

Enrollment and Student Profile: Each semester, there were approximately 30-45 students in this class which included both undergraduate and graduate students. Students are primarily CS majors in this course.

Course Description: The objective of the course is to gain an in-depth knowledge of the fundamental concepts in distributed systems and to understand the practical techniques for building distributed systems and applications. Topics include distributed computing models, naming, synchronization, replication and consistency, fault tolerance, and security. During this course, students design, implement and analyze prototype systems.

Teaching Responsibilities: I have been the teaching assistant for this course for two semesters. My duties included holding office hours, assisting students in designing and implementing their projects, as well as scheduling class presentations, and grading programming projects and exams. Also, I was responsible to collect and report the ABET accreditation data.

CSCI 2610 (@UGA): Discrete Math

Role/Semesters: Graduate Teaching Assistant / Fall 2014

Enrollment and Student Profile: This course had approximately 130 undergraduate students who were primarily CS majors.

Course Description: This course presents a survey of the fundamental mathematical tools used in computer engineering: sets, relations, and functions; propositional and predicate logic; proof-writing strategies such as direct, contradiction and induction; summations and recurrences; elementary asymptotic and timing analysis; counting and discrete probability; undirected and directed graphs with applications in computer science.

Teaching Responsibilities: My duties included holding office hours, assisting students in implementing their projects, as well as grading projects, homework, quizzes, and midterms.

CSCI 4370/6370 (@UGA): Database

Role/Semesters: Graduate Teaching Assistant / Fall 2015

Enrollment and Student Profile: This course had approximately 50-65 undergraduate students who were primarily CS majors.

Course Description: The theory and practice of database management. Topics to be covered include efficient file access techniques, the relational data model as well as other data models, query languages, database design using entity-relationship diagrams and normalization theory, query optimization, and transaction processing.

Teaching Responsibilities: My duties included holding office hours, assisting students in implementing their projects, checking and comparing program performance and reporting the top three based on each programming assignment, as well as grading projects, homework, quizzes, and midterms.

ENGL3400 (@Iran Azad University): C++

Role/Semesters: Graduate Teaching Assistant / Summer 1999/ Summer 2000

Enrollment and Student Profile: This course had approximately 20-30 undergraduate students who were primarily Computer Engineering majors.

Course Description: Software development techniques in object-oriented computer languages with a focus on (C++). An intermediate programming course emphasizing methods, top-down design, testing, modularity, and structured techniques. Applications from areas of numeric and non-numeric processing and data structure.

Teaching Responsibilities: My duties included being the joint instructor for one semester and the sole instructor in the following year. I also had to hold office hours and assist students in implementing their projects and assignments. This course was an extracurricular program.

Activities in the Field of Education

Interdisciplinary Certificate in University Teaching

I earned this demanding certificate offered by the Graduate School at the University of Georgia, which entailed taking four teaching-related courses focusing on the active learning paradigm and effective technology-mediated teaching. I have also done a research project on teaching, which led to a paper.

Membership in the CARPENTRIES Team

I officially perform the duties of a Helper in the Carpentries' workshops and I am in the pool of instructorship for the next workshop in the US. The Carpentries is a diverse global community including instructors, helpers, trainers, maintainers, mentors, community champions, member organizations, supporters, workshop organizers, staff, and a whole lot more. The Carpentries teaches foundational coding and data science skills to researchers worldwide.

Teaching-Related Courses Attended

- **Graduate Teaching Seminar (GRSC 7770)**

  I took this course in Fall 2014. It was the first training course which provided me with the knowledge of different pedagogical approaches and highlighted the available support systems. The supervised lectures and feedback from the instructor and other students helped me shape my content delivery and time management skills.

- **Designing Courses for Significant Learning (GRSC 7900)**

  I took this course in Fall 2016. This course introduced me to the strong pedagogical theories concerning designing a course with a focus on active learning as a powerful approach in promoting creative thinking. Practicing and presenting active learning-based lectures taught me the importance of practical pedagogical approaches in engaging students and developing their interest in the course material.

- **Technology in the College Classroom (EDHI 9040)**

  I took this course in Spring 2017. The course was designed to encourage participants to critically reflect on the use of instructional technologies and develop skills in employing them. We specifically focused on open educational resources, such as Udacity or Coursera, which are reshaping higher education. The course also aimed to answer how academic institutions can integrate these approaches into their education system.

- **Academic Teaching Portfolio (GRSC 7950)**

  I took this course in Spring 2018. It was focused on developing teaching materials that reflect the individual views and experiences into the teaching portfolios. Lectures included discussing different teaching strategies and how to deal with the issues that may arise in the classroom. During this course, I learned to leverage reflective practices for the continuous improvement of my teaching performance.

Webinars Attended

- **The EDUCAUSE 2019 Top 10 IT Issues, Technologies, and Trends**, *Feb 2019 - presented by Mark Askren, Michael Berman, Colleen Carmean, Chris Gill, Susan Grajek from University of Nebraska, California State University, University of Washington, and Drake* University
- **The Future Promise of Analytics in Higher Ed,** *April 2019 - Presented by EDUCAUSE, NACUBO, and AIR from Long Beach, CA*
- **Student and Employer Demand Trends Webcast: Trends in Higher Education,** *Nov 2019 - Presented by Bob Atkins, CEO of Gray Associates, Inc*
- **Getting Comfortable with Thinking Outside the Box: Attracting and Retaining Students,** *Sep 2018 Presented by Greg Kovich and Tim Wilson from Point Park University and Alcatel-Lucent Enterprise*
- **In-Depth Design: Data-Driven Design Strategies to Support Learner Outcomes,** *Oct 2018 - Presented by Ken Koedinger and Padraig Nash from Cengage and Carnegie Mellon University*
- **Supporting Student Success at Community Colleges,** *Oct 2018 - Presented by Dr. Braddlee and Wolff-Eisenberg from Northern Virginia College and ITHKA*

Workshop Attended

- **What a TA can do—Responding to signs of depression and anxiety among your students,** *Sep 2015 - Department of Education - UGA*

  This workshop was basically about depression and anxiety: how severe these problems can be and what percentage of students struggle with it. What depression and anxiety mean and what we can do to help students that may be affected by these problems were the central questions in this workshop. It was an informative workshop about all facilities and help available to students, instructors, and TAs in this regard. The workshop also addressed different scenarios which students may get involved in and how we, as TAs or instructors, should handle them.

Research in Education

During the last years, I conducted the following two research studies about university-based online courses:

- **Sahar Voghoei*, Navid Hashemi Tonekaboni*, Delaram Yazdansepas, Abolfazl Farahani, Saber Soleymani, Hamid Arabnia, "Personalized Feedback Emails: A Case Study on Online Introductory Computer Science Courses", Annual ACM Southeast Conference** (ACMSE 2020) *[* First two authors contributed equally.]*

  The instructors in conventional classes play a crucial role in motivating students to participate in in-class activities. However, in asynchronous online courses, such a relationship where the instructor acts as the observer and the motivator is missing. In this paper, we experimented on an online introductory course in computer science to understand how personalized feedback emails can address this limitation. For this purpose, we designed a forecasting system to analyze the progress of students towards the end of the semester and predict their final grades. Our quantitative and qualitative data analysis shows how such a feedback system can improve both the performance and the level of satisfaction of students in the online classes. More than 42% of students ended up getting grades better than their expected scores, and ~78% of students confirmed that the feedback emails motivated them to enhance their engagement in the class discussions.

- **Sahar Voghoei*, Navid Hashemi Tonekaboni*, Delaram Yazdansepas, Hamid Arabnia, "University Online Courses: Correlation between Students' Participation Rate and Academic Performance", International Conference on Computational Science & Computational Intelligence (CSCI 2019)** *[* First two authors contributed equally.]*

  Although a higher participation rate in online forums has a direct correlation with a higher grade in Massive Open Online Courses (MOOC), in University-based Online Courses (OUC), students with top grades are not necessarily the most active students. Our analysis shows a consistent pattern in UOCs where during the first two-thirds of the semester, students who locate in the GPA range of ~70 to ~80 percentile of the class have the highest rate of participation, while during the last one-third of the semester, the ones who locate in the GPA range of ~87 to ~94 percentile, contribute the most. On the other hand, we found out that the common characteristic of top students in all classes, is their consistency in participation throughout the semester, regardless of the number of their posts.