

For TLC Rectors Awards committee's consideration

2. Philosophy of Teaching

Here I provide details on my philosophy of teaching adopted during my career at Prince Sultan University.

Basit Qureshi

Teaching Philosophy - Dr. Basit Qureshi

Teaching is an invigorating and complex process that enables learning by facilitating experience using cutting-edge technologies and best teaching practices. At the onset of my academic career, fifteen years ago, PSU had virtually no quality framework or teaching practices in place. By adopting quality teaching practices followed at my Alma-mater and through years of experience, in addition to following best practices as defined in UKPSF, I have been able to define learning outcomes for my courses, pre-plan teaching activities, disseminate course works, analyze student performance, design quality assessments, embed professionalism and lifelong learning in addition to utilization of technology in enhancing the teaching and learning experience of my students. I strongly believe in the fact that the best approach for learning is doing-by-practice as it increases the confidence and experience of students in achieving their learning objectives.

My teaching philosophy rests on six key practices.

1. Promoting critical thinking and enhancing technical skills:

As an instructor of Computer Science, I am required to inculcate theoretical foundations and their practical applicability in my students. A facet of critical thinking in informatics is to observe and analyze conceivable ways to afford efficient and enhanced solutions to any real-world problem. To this end, it is important to understand the principles of finding an efficient solution by being able to criticize the strengths and weaknesses of various solutions. My teaching approach instills critical thinking consequently improving the cognitive function of learners with a focus on the practicality and efficiency of any given solution to a problem. Based on my experience teaching at Prince Sultan University, I strongly believe in doing-by-practice approach where I use the available technology to demonstrate the applicability and efficiency of various solutions in class.

My teaching strategy depends on the outcome-based learning approach where course learning outcomes are defined at the start of a semester whereas all course content, delivery, assessments, and measurements are aligned with these outcomes. At the end of every semester, to maintain quality, I use quantifiable data from course learning outcomes through various mediums (surveys, assessment results etc) achieved throughout the semester to reflect upon the learning experience of students in order to enhance my teaching approach and alter teaching strategies for future terms as necessary.

2. Adoption of technology for enhancing learning experience:

In the era of technology, traditional classroom-based teaching needs to be enhanced by incorporating technology into teaching. The university provides various such facilities such as the availability of touch-screen smart boards, Learning Management System (LMS), Computer labs, and various software to support the environment.

- **Web-presence:** It is important for me as an instructor to have a strong web-presence, improve utilization of technology in teaching and stay in touch with my students. Back in 2002, I was able to convince the university management to host a web server for faculty members at PSU, since then, I have hosted and maintained my website on this server. My website is popular with users and my students which can be arbitrated by the fact that a google search of my name hits this website as the top search result! My website provides detailed information for my students including syllabi, course contents, lecture notes, links to relevant materials, YouTube videos and assessments etc. (<http://info.psu.edu.sa/psu/cis/big>)

- Learning Management System (LMS): I was part of the team that evaluated and recommended moodle to the IT center at the university. A customized version of Moodle is currently adopted at PSU. I have been using Moodle to allow students to submit their projects and assignments.
- Visual Learning: I am an avid fan of visual learning methods to augment theoretical concepts in computing. I have been using various resources on the Internet to visualize various concepts. I have written a user manual for writing programs using flow charts, which is a visual medium of writing programs. These visual programs are written and simulated in Raptor software tool and used in initial program course at PSU. (<http://www.visualgo.net>)
- MOOCs: Massive Online Open courses nowadays are widely available. A majority of these courses are supported and provided by various top universities around the globe. I use various courses in Coursera to provide innovation in my teaching as well as enhancement of tools and technologies used in my course delivery.
- Hacker-rank: provides a platform for students to practice and test their knowledge on the Internet. I introduced this platform at PSU and routinely require my students to practice using this platform. (<http://www.hackerrank.com>)
- YouTube videos: I have a YouTube channel to provide support for weak students. On this channel, short videos and demonstrations are posted for students who find it hard to follow some critical concepts in class (<https://www.youtube.com/channel/UCxm-RmeZ85U7aAKVH7SPUkw>).
- GitHub Repository: I have been using Github for sharing the code written in class for my courses. Students regularly visit this repo to download and practice using my code. My git repo is available at (<http://www.github.com/basit388>).
- Oktopus: I use Oktopus screen editing software to provide solutions to tutorials. These solutions are posted on my website.
- Whatsapp: I maintain a WhatsApp group for all classes taught each term so I can stay in touch with my students and maintain a strong communication channel.

3. Adoption of research and best practices

Over the past two decades, there has been a seemingly unending supply of new knowledge and potential for growth in computing. Research and innovation have been at the forefront of computing. As an active researcher, I have acquired several funded research projects that have culminated in the establishment of research labs. From my KACST funded research projects, I have developed a Cloud computing cluster which is currently housed in the RIOTU@RIC (<https://youtu.be/T9jyowdPSJk?t=906>). I use this cluster of computers to teach SE409 Cloud computing course. Students from this course have used the cluster to develop software and write research which was presented at the undergraduate research forum in 2017.

Two of my Master's students have also completed their MSE thesis research using the equipment from projects funded by PSRTC and KACST. Research work conducted using this equipment was reported in three conferences and two journal papers. Research results contributed from students in my SE501 course helped me in improving the course contents. I have routinely used research papers in teaching advanced undergraduate and graduate course at Prince Sultan University.

4. Embedding professionalism

Teaching in Computing demands professionalism, embedding professionalism in courses is an important trait for my teaching practice. I take pride in introducing and invigorating professional standards and best practices to my students. A measure of professionalism is the attainment of industry standards and

certifications. All of my Programming students are introduced to Oracle certification programs in the first programming course offered at PSU. So far 11 students have applied for a qualified for Java Associate certification. I am also a member of Oracle and EMC2 academic alliances and have access to their resources. I routinely use these resources in my teaching to raise awareness for professional quality and standards among my students. I have collaborated with the EMC2 academic alliance to develop the SE409 Cloud computing course at PSU.

I am also the founder of Programming Jam competitions (<http://www.programming-jam.com>) held at Prince Sultan University. This competition encourages students to work as teams to solve problems using a global virtual environment. I managed to secure sponsorship for these events to enable PSU students to compete and enhance their problem-solving skills.

I have also mentored students for the IEEE Extreme competitions since 2012. These competitions help students learn about professional standards and provide opportunities for them to embed professionalism in their practices.

5. Preparing for work environment and lifelong learning

The CS and SE programs at PSU train students for the work environment. I strongly believe that industry leaders and professionals can provide very useful experiences and guidelines to my students. I have routinely invited external speakers and industry leaders to provide lectures, talks, seminars and workshops at PSU for graduate and undergraduate students. Various professionals including System analysts, Development managers, CTOs etc. from well-known global companies such as IBM, Oracle, EMC, HP, VMware, SAP, Al Elm have provided lectures and seminars at my invitation. Part of these lectures and seminars were delivered as advanced topics in my classes. Such activities allow students to learn from the experiences of industrial partners and gain from their experience in the professional work environment.

As an innovation of computing tools and technologies moves at a phenomenal pace, life-long learning opportunities need to be availed. MOOC platforms such as coursera, provide opportunities for learning newer concepts and technologies in a professional environment. My students are aware of these courses and regularly visit these websites to gain knowledge and improve understanding of critical concepts.

6. Ethics and values

Morals, ethics, and values are strongly connected with teaching and learning. As knowledge and technology can be used for the benefit of humanity, equally so, it can be abused. It is important to highlight the ethical responsibilities of professionals in theory and practice. I regularly use plagiarism detection tools such as iThenticate and Turnitin for evaluating students work. Hackerrank provides code similarity tool that helps in detecting the similarity of code in student's submissions. In essence, students are encouraged to be honest, respectful, professional and responsible individuals that follow Islamic principles and virtues.

In conclusion, I believe teaching is the most rewarding profession. It gives me great pleasure to witness the feeling of achievement of CS101 course students where individuals with zero-knowledge in programming have gained enough experience that they not only write simple code but indulge in providing an efficient solution to given problems using professional tools. At Prince Sultan University, I have grown as a professional that regards teaching and learning as my professional responsibility.