

Preparing a diverse student body for successful careers in Computer Science can be very challenging because these students must be prepared to both enter the workforce meeting the needs of current employers and to continually learn and grow with the field in order to have a successful career. Computer Science is constantly evolving and the demand for specific skills undergoes constant change, but there are some core ideas which can be adapted to meet the needs of any new technology or application. Some of these core ideas are focused on content mastery, such as data structures and algorithms, while others are focused on the student, such as problem solving, critical thinking, working within teams, but all must be mastered for the student to achieve success.

Since every student has different needs, my teaching style is focused on integrating the four learning styles of Fleming's VARK model, namely the Visual, Auditory, Reading, and Kinesthetic learning styles, while covering the core concepts and giving the students the practice they need to master those skills and concepts. In order to support the reading learning style, I select a textbook based on its accessibility at the appropriate depth. Although, I never teach directly from the book, a good textbook can provide structure, provide additional examples, and serve as a useful reference later in the future careers of my students. The auditory learning style is supported through lectures, the visual learning style is supported through the use of examples during the lecture, and the kinesthetic learning style is supported through individual and group assignments.

In designing classroom presentations, I employ a variety of teaching techniques to ensure the needs of each of my students are being met. The first technique I employ is to ensure that proper motivation is provided for each learning activity. The students are presented with real-world problems which can be solved using the skills or by applying the concepts discussed in class. Providing proper motivation for all classroom activities is crucial to engaging the students and promoting active learning. For example, in a Data Structures course, prior to discussing the searching problem and solutions, I discuss how searching is used in everyday life, from going to the grocery to ordering lunch, all objects must be located prior to use. The second technique I frequently utilize is the use of examples which provides support for the visual learning style and allows students to use preexisting knowledge to help gain perspective on the problem or concept. As an example, while discussing searching and binary search, I discussed searching for a name in the phone book. The students were able to use their experience looking up names in a phonebook to help them visualize the algorithm. This technique not only helps the students understand the topic, but it allows them to internalize the topic as well.

Several techniques for designing activities, such as in-class assignments, are employed in order to provide each student with the core concepts and practical skills they need. One of those techniques involves the use of individual or group in-class assignments, which allow me to gauge how well the students understand the material I am presenting. These assignments, which are often short, also provide the means to break long lectures into smaller, more readily accessible, chunks. For example, in a Data Structures course, after discussing binary trees, I wrote two sequences of numbers on the board and asked them to insert the first sequence and delete the second. The students overwhelmingly understood insert, but one of the three cases of delete had caused major confusion which I was unaware of until after the assignment. This approach allows me to recover the material that is causing

confusions, thus improving student understanding of the material. Additionally, it provides me with insight into how I may improve the teaching of the material in the future. In-class assignments are a useful gauge of student understanding, but homework is essential to ensure that students are provided with the opportunity to practice their craft and hone their skills.

Students often learn more outside of the classroom than in one, so homework assignments are extremely important, especially considering the learning of skills, such as programming, which require a healthy amount of practice to master. The assignments must be challenging, have roots in the lecture material and examples, and be real-world problems with multiple solutions so that students can practice their problem-solving skills and critical thinking skills in coming up with an optimal solution. An example of my use of this technique involves asking the students to implement the binary search and a brute force search algorithms and develop an empirical analysis of the associated runtime costs of each. This assignment was designed to provide motivation for algorithm analysis and allow them to practice employing an empirical analysis. Homework assignments are essential tools in ensuring that the students have the practice they require in order to be successful.

In order to continue teaching the core concepts and practical skills necessary for students to have successful career, it is important to learn to adapt and change to constantly evolving circumstances. As an educator, I must adapt to each new class, adapt to changes in the field, as well as changes in the teaching of the field. Adapting to each new class requires the use of some instrument to measure the progress of the students, not only for grading, but for ensuring that the class is acquiring the expected skills and knowledge. As discussed, I give a variety of assignments to this end, but I also often query the students for direct assessments of my teaching, usually after covering a sticky subject or giving a quiz with unexpected low grades. Adapting to each class is vital to ensure the success of the students because it encourages student involvement in the course and helps me improve my teaching of the subject. In order to continually teach courses in an ever evolving field, it is also important that I stay current in the field, which implies continuing to perform research and contributing to the field as well as adapting new ideas and technologies for incorporation in the classroom. That research may involve contributions to the field or contributions to the teaching of my field, which are both very important for my long-term growth as an educator.

Ultimately, my teaching philosophy seeks to ensure that every student is provided the opportunity to learn the core concepts and practical skills they need and to grow as individuals. Every student is provided a clear set of learning goals or objectives, guidelines to follow, and an assurance that I am here to help them succeed. It is important that we provide an atmosphere of trust and understanding to maximize our effectiveness as educators. I have an open door policy, provide my students with alternative means of contacting me (instant messaging), and understand that each student is unique and capable and must be treated as such. Although all students are ultimately responsible for their own education, it is our responsibility as educators to ensure that we maximize the potential of every student who puts forth the effort. In doing so, we will ensure that our graduates, who are direct reflections of us, are not only competent and successful in their field, but also capable of contributing to it and the society they find themselves in.