The role of computer science minors in undergraduate and graduate curriculums

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It has been estimated that over 200,000 computer-related jobs went begging in the United States in 1974 because of lack of qualified college graduates. Both Industry and Government are concerned about the lack of practical knowledge of college graduates. A national survey estimated that 95 percent of all undergraduate business majors had to be re-educated to the tune of $8,000 each on the average before they could be considered productive workers.

Many academic disciplines such as business, engineering, mathematics, etc., have recognized this problem and have begun to offer a limited number of computer-related courses in each discipline. These attempts have not been fruitful because of the lack of computer science expertise of the instructors. This is to be expected because a professional cannot be an expert in every academic field. In other words, engineers normally do not attempt to teach English, Biology, etc., in the Engineering discipline. It therefore seems reasonable to develop computer science minors for related disciplines, administered by the computer science discipline exclusively.

Many universities have developed computer science major disciplines, but few have concentrated on the need for computer science minor programs since the primary effort for most academic discipline developments is in the major course areas. Much effort goes into cultivating students with majors in computer science (in some cases “luring” students from related disciplines). Some generalized courses (non-major) are sometimes created to boost student credit-hours for the department such as introduction and survey courses. This type of protective development further alienates related disciplines from computer science.

Courses should be developed with specific related disciplines in mind for providing the greatest benefit of computer knowledge to that discipline. This type of course development (minor in computer science) such as developed at Texas Tech University, Lubbock, Texas, is inherently interdisciplinary. A program of approximately 18 semester hours of computer science has proven to provide a sufficient base of computer science knowledge. A core of courses that include the most commonly used computer languages (FORTRAN, COBOL, BASIC, ASSEMBLY) should be taken before more specific discipline-related courses are taken. The languages provide a basic understanding and appreciation for computer processing, logic, and applicability. Specific applicability can then be provided for each separate discipline.

Not all computer-related jobs require the broad range of computer science knowledge which is normally provided to computer science majors, but basic computer knowledge applicable to the application area is of use. Students minoring in computer science at Texas Tech are encouraged to engage in actual practical application of computer knowledge of their particular discipline. Local industry has an in-depth appreciation of the value of the computer science minor program at Texas Tech and are involved in hiring these students as well as providing feedback to the department about lacking areas. The Texas Tech Medical School utilizes a good many mathematics and engineering majors for computer operations, maintenance, programming and systems analysis. Several manufacturing firms utilize a large number of business majors for computerized accounting, inventory control, and production control program development and maintenance. Computer science minors in an interdisciplinary environment should be considered as a viable alternative to computer science training.