Advising students in technical projects - recognizing problem scenarios

In this paper, we consider the advisor’s role during the technical work and the thesis preparation for a student in the final phase of a course of study in an engineering education. We initially claim that there is a marked difference between the learning that takes place in regular course work and the learning ensuing from project work. Concrete differences include that:

• unlike the a-priori fixed curriculum of regular courses, an important aspect of a project is to define and scientifically formulate the problem itself, in which the student is to be engaged.
• projects are carried out individually or in very small groups. For an interesting project, the precise outcome cannot be known in advance.
• The flexible and individual nature of each project requires that time must be carefully divided and managed between defining the problem, seeking information, implementing solutions and presenting results.

While students work hard during projects and advisors will do their best to support the students’ activities, it is not uncommon that a student fails to meet either his or her own expectations and/or those of the advisor. Occasionally, this is true also of students who perform brilliantly in regular courses. The goal of this paper is to relate the authors’ experiences and investigations into the project advisory process and to provide recommendations for other engineering educators.

After an initial discussion of a typical engineering project advisory process, we review a number of representative projects (abstracted and anonymized) and analyze conditions under which a failure to meet or match expectations is likely to arise. This leads us to a small number of scenarios, where a student is likely to under-perform. Common to these scenarios is a lack of balance between the necessary activities in an engineering project. As our main contribution, we investigate and categorize these imbalances leading to the aforementioned scenarios. Finally, we distill suggestions for best project advisory practices.

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