

Beyond The Books: Project-Based Learning at AUCA (1)

Part of my devoir as a Teaching Assistant for the Software Engineering department is to design [programming projects](#) for students. The purpose of these projects is to acquaint students with what they will later face in the workplace—like dealing with large pre-existing codebases—as well as serve as a training ground for everything they have learned throughout the course. If the concept of projects seems nouveau – it needn't be. I maintain that such projects provide the best medium for learning; in spite of that, only a select few professors at AUCA nurture this practice. I believe that wide adoption of this practice will enhance students' learning outcomes, and I will explore this hypothesis over a series of articles. This article in particular will present and analyze opinions circulating around projects among those who have either gone through or have implemented them, capture the history of project-based learning at AUCA, and answer why having projects in courses matters.

Though projects may focus on a number of topics, one aspect remains central: the spirit of “exploration.” The addition of projects to the Introduction to Programming and Object-Oriented Programming courses was not purposeful—it came about as a result of Dmitrii Shostak's hobby of replicating simple games like *2048*. He would then demand that his students did the same, and it was his students who would then *suffer the joy* of “exploration”—being given an objective with no clues of how to reach it. We have since become more humane and began providing initial steps and well-defined concrete goals—with my introduction, we have even introduced implementation tips. Nevertheless, this sense of being lost and having to circumnavigate real world problems on your own is what yields incredible learning outcomes. As a testimony to that:

Based on their own reports, students have a mostly-to-very positive outlook towards project-based learning. An anonymous survey distributed among students (sample size of 37) taking the Object-Oriented Programming course reveals the following: 86% believe that projects improved their ability to code (57% do so strongly); 68% enjoy working on projects (24% strongly), while 29% are indifferent; 86% believe projects should be introduced to reduce the point-weight of exams (37% strongly); and 76%

believe other courses should also have projects (when they are applicable). Besides these data points, some students have commented that, “[these] projects introduce you to what programming is actually like,” and “projects give a tie to what is taught in the course, strengthening [your knowledge of] it.” On the whole, among students, the perception of projects is positive.

The advent of these projects needn’t be accidental. Among the faculty members I have interviewed, some reported that they adopted projects into their syllabi based on workshops they have attended or they have borrowed the practice from a fellow faculty member. This suggests that projects are akin to an evolutionary pinnacle, *like crabs*, to which every taught course naturally strives. Courses needn’t stumble into this discovery: project-incorporation can be fostered; as such, the “gospel of projects” *should* be spread, especially considering the positive reception of it among students. However, the position of faculty also needs to be considered in this:

Faculty who have integrated projects into their courses likewise have a positive stance towards projects. The following sentiment has been universal: while projects require additional effort to create, that cost withers away the moment the projects are presented. Indeed, there is nothing more personally rewarding than witnessing your students grow by means of a project you have designed—speaking from experience. Yet the implications of these projects reach beyond their respective courses: they can be combined with doing civil service in coalition with intra-university offices and clubs (primarily, the Center for Civic Engagement, &c). This work inevitably contributes to a student’s portfolio, regardless of whether it gets published on the university’s webpage (and some projects have!) or not. Naturally, work of such a caliber might be too tumultuous for individual implementation, so courses could also explore the possibility of group projects—endorsing connections between students and contributing to their interpersonal skills.

Despite everything mentioned heretofore, projects could have potential drawbacks. For one, projects are a serious test to an individual’s time management skills. This concerns not only students with tendencies to procrastinate, but also top-performing students, who may overfocus on these projects and hurt their academic performance on other

courses—stripping themselves of opportunities. That, however, is a concern that is easily addressable by fostering better time management skills. Second, projects should not be plastered onto every single course. If there are too many projects, they lose their uniqueness, students lose interest in them, and projects lose their effectiveness. However, not every course is compatible with project-based learning, which, in turn, addresses this concern. In spite of these concerns, faculty do maintain a very positive outlook towards project-based learning.

In light of all this, it is time to return to the main question: why does having projects in courses even matter? It is a well known fact that only 10% of the material received during a lecture or through reading is retained, and about 30% is retained with homework added. Projects are needed because they are a panacea for courses taught in the oh-so-typical lecture/seminar+readings format, which not only enhance learning outcomes, but engage students in society, help them build a portfolio, deepen their interest in the subject, improve their autonomy, and decrease their stress during the exam period by [reducing the point-weight of exams](#). Our university is the leading hub for ideas and development in the region, and further ingraining project-based learning into our courses will further foster this among both our faculty and students. Though there is still much I need to research on this topic, such as: what is the sentiment towards projects among students and faculty who have had no exposure to project-based learning, and how feasible the implementation of such projects is at our university—if my hypothesis about the benefits of project-based learning proves right, the next time senate elections come around at our university, you will doubtlessly see me campaigning to advance project-based learning at AUCA.

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