

Establishing a Core Curriculum at the College Level

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Abstract

The process of developing a core curriculum can be long and detail intensive. This is especially true when the core curriculum spans several departments or degree programs. Similar to many academic institutions, the College of Technology at Purdue University has recently implemented a core curriculum that has significantly altered the plans of study for multiple departments with diverse curricula impacting 1000 incoming students annually. This paper describes the process followed by the College of Technology in planning, developing, and implementing the core curriculum, and explores the positive and negative impact of the core on the various departments in the College.

Introduction

Many colleges and universities have struggled with the decision to implement a core curriculum of basic subjects or courses. Over the past 50 years, academic institutions at all levels have debated the pros and cons of core requirements. Many, such as the University of California at Berkeley, Stanford, Yale, and Cornell, do not have a strict formal core, or only have a minimal requirement that can be met with one or two classes. Others, such as the University of Texas at Austin, St. John's, and Columbia University have much more deep and structured general education core requirements.

Arguments in favor of a structured, deep core curriculum include the need for academic balance, a well-rounded educational foundation, and exposure to courses and topics outside the student's major field of study. The goal of the core is to enhance the breadth of the educational experience, developing appreciation for other fields, and providing access to general content of knowledge that will benefit the student after college and into their career.^[3, 5]

Those opposed to the concept of a core curriculum note that many are overly structured and constrictive, limiting the student's freedom to choose courses that would further academic specialization. This argument is supported by many in high technology fields, where it is often difficult to dedicate the credit hours necessary to cover topics to appropriate levels of detail.^[2] Another objection of non-supporters of curricular cores is that many of the core topics are outdated or irrelevant in today's society.

The College of Technology

The College of Technology at Purdue University consists of more than 3,500 students in six academic departments: Aviation Technology, Building Construction Management, Computer Graphics Technology, Computer Information Technology, Engineering Technology, and Technology Leadership & Innovation. Due to a desire to be strategic with limited resources, as well as to enhance student educational opportunities, an effort has been made over the last several years to find common areas of course content, overlapping courses, and collaboration opportunities for the various departments. It was decided that a core curriculum implemented at the College level would help in achieving these goals. As the various programs dealt with similarities in accreditation requirements and the development of ‘soft skills’ (critical thinking, communication, ethics, teaming, etc.), looking at a common core of courses became a logical point of focus.

The Development Process

The process of developing the core curriculum for the College of Technology was quite lengthy and involved. A formal five step process was implemented and guided by the Associate Dean for Undergraduate Education. The five steps of the process were:

- Identify characteristics of successful professionals in technology fields, and of College of Technology students
- Analyze current curricula in the College to identify common components
- Complete a Delphi study of the skills identified in the first step to place them in a ranked order of importance
- Complete a benchmark study of existing core curricula at Purdue University and other academic institutions
- Explore delivery methods, such as distance technology, to make the core as portable as possible

Similar stages have been utilized by others when designing core curricula in post secondary settings.^[1, 4] These five steps were successfully completed thanks to the participation and input of a significant percentage of the faculty in the College. The process was open to any faculty member that had interest, and many took advantage of the opportunity. Balanced representation was also ensured by asking each department to have faculty representatives identified that would participate in the process.

The first step of the process identified key characteristics common across the fields of technology, including critical thinking and problem solving, entrepreneurial spirit, practical skills, teamwork, etc. Using these skillsets as a catalyst helped drive the development of a projected list of skills/expertise that would be needed by our graduates five years after leaving

the University. These target skills helped drive the remainder of the development of the core concept.

While common components and outcomes were identified in the second step of the process, it was discovered that there was only one course offered at the University that was common to all the degree programs. It was also found that most of the programs preferred to have students participate in hands-on, laboratory based activities early in their programs, which was a potential issue preventing easy core implementation.

The multi-round Delphi study identified a number of skills that were to be considered top priority for the core. These included the expected topics of problem solving and critical thinking, but also included written and oral communication, decision making, creativity, and ethics as key components to be considered.

The benchmarking exercise undertaken as the fourth step in the process clearly indicated that there were many types, versions, and assortments of core curricula in other programs. Very few of these seemed to address the skills identified in the Delphi study, resulting in the decision to design our own from the ground up, which would fit our unique needs. Due to the extended campus nature of the College of Technology, and with a focus on increasing international student activity, it was also decided that the core solution would need to be amenable to distance delivery options. Either/both synchronous or asynchronous solutions were determined to be a possibility for future growth and implementation.

Results

As a result of these efforts, three main ideas appeared, resulting in the development of three distinct courses that formulated the new core of the College of Technology. These three ideas involved individual impacts of technology, global aspects of technology issues, and leadership implications of technology. Fundamental skillsets of communication, ethical thinking, creativity/ideation, problem solving, and technical literacy all fit well into the first category. The global aspects of technology attracted the concepts of societal focus, cultural awareness, designing in context, and teaming. The third concept seemed to attract the concepts of team leadership, project management, presentation communication, systems thinking, and organizational interaction. Three courses were identified to meet these groupings, with the goal of integrating them into the curricula of each department.

Challenges

A number of challenges needed to be overcome before the core curriculum could be implemented. As mentioned previously, the College has a strong 'hands-on' tradition that gets students involved very early in their degree programs in learn-by-doing activities. The basic concept of a common core works against this precept by limiting all students to foundational commonalities that do not necessarily fit the disparate skills required in these six diverse

departments. This problem was further exacerbated by a parallel effort to implement core curriculum requirements at the University level, and a limit to the number of credit hours for every degree program mandated by the state legislature. These challenges led to the establishment of a College core curriculum policy that helped each department address how to fit the College core requirements into their programs.

Additionally, the College had to address three other major issues before successful implementation occurred. These involved final agreement and ‘tweaking’ of course content, resource allocation, and oversight/governance of the core curriculum. It was very rapidly discovered that the core courses could not be ‘all things to all people’, and that compromises would be needed regarding specifics of content and depth of coverage. This process is ongoing, and involves strategic review on a periodic basis. The issue of resources was quickly identified: providing instructor coverage for approximately 700+ freshmen students each fall, plus smaller cohorts of 250 – 300 in the spring semesters, would require a significant commitment by the departments on an ongoing basis. Finally, the governance of the core curriculum needed to be decided. The structure of the College has each department housing a curriculum committee to deal with their specific courses and plans of study. With the College core crossing all departments, there was no curricular body to oversee necessary modifications to the core courses. All three of these issues remain as challenges, but working solutions have been implemented.

Conclusion

We are pleased to report the successful implementation of a core curriculum in the College of Technology. Although the development and implementation process was lengthy and challenging, the result has been satisfactory. It has been interesting to observe the continual evolution of the core during its first few years of existence, and to note the aspects that have been more successful (and less successful) than initially anticipated. The College has grown significantly by going through this process and the end result has benefited the students of the College in many ways.

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