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Process, Not Particulars

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An isomorphism is a bijective mapping that is operation preserving under multiplication and addition. I learned the definition of the word isomorphism for the first time this summer. I knew it inside and out, all of its properties, every theorem to which it could possibly be applied in my Mathematics 31: Abstract Algebra course. But not until I walked alone across the Green one sophomore summer morning did I realize what it meant, what it actually meant, to the study of humanities at Dartmouth and the pursuit of knowledge in general.

In layman's terms an isomorphism is a tool that mathematicians use to confirm that two things are, for all intents and purposes, the same. I claim that this word can help us understand the purpose of a liberal arts education.

Assuming I've bored you with math jargon already, I'll start by considering the writing of a generic essay. What is the process of writing an essay? One decides on a topic, gathers resources, claims a thesis and then defends that thesis. In the process, new insights are gained and the thesis or structure of the essay is updated. Eventually, the writer has created an original product with the help of past thinkers and their essays. That seems pretty straightforward, yet still irrelevant.

Next, consider the composition of a drawing. The process to go from a blank piece of paper to a completed piece of art is a remarkable one. The artist lays out a plan, decides on the necessary tools and begins. The original plan is revised and often cast away completely. The drawing is a process of a multitude of decisions, each one affecting the whole composition. When finished, the artist has forged an entirely new entity, through his own creativity and also his experience with other artists and their work. Is a trend emerging?

Finally, imagine the construction of a mathematical proof (If you despise math, simply skip to the next paragraph; I won't be offended). First a mathematician learns the skills of her trade: definitions, corollaries and theories. When presented with an idea to be proved, she utilizes these mathematical building blocks to construct a first attempt at a proof. A peer review reveals a gaping hole in what was thought to be an airtight solution. Through creative revisions and collaboration, a new and correct proof is offered. But what's that have to do with an isomorphism?

The epiphany I had one morning was this: writing an essay, composing a work of art and constructing a mathematical proof are entirely isomorphic. They are effectively the same process, just with hugely different mediums. In each case, a student is presented with an empty slate and eventually arrives at an original composition. Along the way, the student thinks critically, makes decisions and hopefully collaborates with peers and references existing resources. Mastering this process of composition is to me the ideal goal of studying the humanities.

Creation and composition are the most vital exercises in an undergraduate education. The beauty of treating the aforementioned creative pursuits as isomorphisms is that then the medium of expression doesn't matter. What matters is the thought process, the ability to start from scratch and arrive at reasonable and well-founded conclusions. The acquisition of facts and figures is a small matter compared to cultivating the ability to create and think.

I therefore disagree with the notion that the goal of the humanities is to make us scantly knowledgeable in a variety of disciplines. We should not be made to memorize historical buzzwords or cultural references even if they are "expected" of Ivy League graduates. What we should do is learn the nitty-gritty specifics of a given topic and then use them to say something profound about the world. I may not remember the definition of an isomorphism in 20 years but I will still own the creative and collaborative skills I developed while using the term to construct a math proof. These skills transfer to any discipline in life that requires critical thinking.

I believe it is imperative to maintain specialization and specificity in the humanities. Because it is by learning to approach and analyze smaller concepts—not just learning what the concepts are—that students can proceed to compose thoughts and products of their own. For example, who knew that the mathematical concept of an isomorphism, an obscure and specific one, would ever appear in an opinion piece about the objective of the humanities?