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THE BIRTHPLACE OF INNOVATION

Interdisciplinary program aims to produce the next breed of product innovators

By Drew Vass

At the March 2011 unveiling of the iPad2, former Apple CEO Steve Jobs stood in front of two street signs — one labeled "liberal arts," the other "technology."

"It's in Apple's DNA that technology alone is not enough," Jobs exclaimed. "It's technology married with liberal arts — married with the humanities — that yields us the result that makes our hearts sing."

The innovation occurring at the intersection of "liberal arts" and "technology" lanes can be described as interdisciplinary. Three years ago, faculty members at Virginia Commonwealth University set out to backward engineer a curriculum designed to create individuals geared for this type of approach. The resulting Master of Product Innovation program teaches students how to bridge the disciplines of art, business and engineering for the purposes of product design. It is the first of its type in the U.S.

"When you specialize, often your ability to innovate becomes limited," says Kenneth Kahn, Ph.D., director of VCU's da Vinci Center for Innovation and the M.P.I. program. Kahn points to Apple's iPad as an example of interdisciplinary design but says the concept applies to products much less chic. He shares an example of a team of VCU undergraduate students — students majoring in business, engineering and sculpture — tasked with creating an eyedropper for glaucoma patients.

"The value that the sculpture student brought to the design was amazing," Kahn says. "They were doing the molds and bringing in a view of what form the product could take."

Meanwhile, engineering students were busy converting those designs into CAD drawings, which could be manipulated and tested for function.

"The ability of those CAD drawings to bring the sculptor's ideas into a real form just places it in an entirely different light," he says.

The business students conducted research to determine product viability, market constraints and regulatory issues for the new dropper.

That's not to say that the same threefold process isn't involved in the design of many products; the difference is, in this case, rather than taking a compartmentalized approach, the three disciplines collaborated in real time, informing one another's efforts. All shared the common goal of creating a successful product, but what defines successful is inherently different for each discipline. From an engineer's perspective, success may be measured by how well a product functions. A sculptor will naturally focus on aesthetics. From a business perspective, success equals commercial success. But, to be truly successful, a product must meet all of these criteria. At the same time, individuals from various disciplines don't always mesh as willingly as colors on an artist's palette.

"Different perspectives make different assumptions about the world. And some of those assumptions are incompatible," says William Newell, Ph.D., executive director of the Association for Integrative Studies and professor of interdisciplinary studies at Miami University. "The differences in those underlying assumptions clash, but the clash between those various perspectives is what gives interdisciplinary study its energy and power. The challenge is in creating some common ground that allows you to bridge those assumptions."

And so VCU faculty members set out to establish that common ground. "We said, 'Wait … can we build a curriculum around this?'" explains Rosalyn Hobson, Ph.D., associate dean of the School of Engineering and one of the designers of the M.P.I. program.

The idea brought faculty to the table to discuss a program designed to turn out graduates trained at guiding collaboration among disciplines for the purposes of product innovation. They began by developing a list of attributes a product innovator ideally would possess.

In interdisciplinary practice, it is thought that by blending various disciplines, solutions and ideas surface that wouldn't have originated from any one.

"It is when you lose that objectivity, because you're so passionate and deeply entrenched in your discipline, that you lose sight of the bigger project," Hobson says. "When you don't see the value of the contributions of each part to the whole, you lose true innovation."

M.P.I. majors aren't required to become experts in arts, business and engineering; they're merely expected to have a basic knowledge of each to relate to and bridge the various disciplines.

The full-time M.P.I. program includes a minimum of 30 credit hours over the course of four semesters. The curriculum required the creation of seven new courses, including three introductory classes, one in each discipline. Beyond the basics, M.P.I. students take a course designed specifically for developing their design skills and they participate in a semester-long da Vinci Center project in which they learn things such as project management, team building, concept generation and testing, market analysis, visualization and prototyping. The program's grand finale includes a two-semester-long Master's Project in Product Innovation, a real-life product development initiative that is either company- or student-sponsored.

The program will begin enrolling students in the spring 2012 semester. The program's designers believe M.P.I. graduates are slated to become a new breed of employee.

"Originally, we intended to give our engineering students a means for distinguishing themselves," Hobson says. "But I believe we're answering a real need."

Kahn concurs, adding that interdisciplinary product innovation is critical, especially in tough economic times. "It's a tough thing to do, but those companies that focus on innovation in a downturn will come out ahead down the road," he says, pointing out that Google emerged on the tail end of an economic downturn.

Photo courtesy the da Vinci Center for Innovation

Kenneth Kahn, Ph.D., (front left) director of VCU's da Vinci Center for Innovation and the M.P.I. program, hopes the center's undergraduate students (also pictured) will continue their studies under the new M.P.I. program.

TRAILBLAZING

The M.P.I. program isn't VCU's first attempt at creating an interdisciplinary program based on an entirely new concept either. In 2006, the university launched an interdisciplinary Ph.D. in Media, Art, and Text, overlapping the School of Arts, the School of Mass Communications and the Department of English. As with M.P.I., MATX is the first of its kind in the U.S.

"There wasn't necessarily any 'Ah ha!' moment," says Catherine Ingrassia, Ph.D., executive associate dean for the College of Humanities and Sciences and one of the masterminds behind the MATX program. "We had great strengths in the School of the Arts, in the existing graduate program in the English department and then the School of Mass Communications had a lot to offer in terms of media and new media. Looking at how those pieces could fit together and what that could mean for a Ph.D. program, it became apparent that the orienting concepts in each — media, art and text — could comprise the program."

In one of its recent commercials, Apple suggests that, "We can now watch a newspaper," referring to how the iPad blends multimedia with text. The MATX program is designed to produce individuals who understand how media evolved from oral, to print, to digital and finally to the type of mixed-form media the iPad might host.

"This turned out to not just be about the present, with new media and such, but also about the historical dimensions," Ingrassia says. "There have always been new forms and types of media, so we were really interested in thinking about that as well."

Marcel Cornis-Pope, Ph.D., the first director of VCU's MATX program, draws similarities between M.P.I. and MATX based on the type of collaboration MATX designers intended to cultivate.

"From the beginning, it was our intention to recruit students with diverse backgrounds in the arts, communications studies, literature and cultural studies and encourage them to collaborate toward new interdisciplinary projects and synergies," Cornis-Pope says.

Ingrassia suggests that interdisciplinary programs such as MATX tend to be less static than those falling within a single discipline. Instead, they tend to constantly evolve.

"Planning the program and in thinking about what form it would take, we were very careful to remember that we didn't know how that would change in the long term," she says. "I think that's the nature of a lot of interdisciplinary programs, because you're drawing from multiple areas — not for the sake of creating a new discipline — but as a new means for looking at things and for creating new types of knowledge. You don't know what the results will actually turn out to be."

Newell, with the Association for Integrative Studies, says he's spent a lifetime trying to demystify interdisciplinary studies and curriculum design.

"There's an element of creativity involved in figuring out how the various parts work and fit together," he says. "For years there was this presumption on the part of many that if you were interdisciplinary you had no area of expertise, and that you were a generalist. They looked down on interdisciplinary studies because they felt there was no depth. We've mostly gotten past that. We've now teased apart the various parts or steps in the process of doing interdisciplinary work."

At the same time, designing curriculums for a constantly evolving program can be a bit like taking aim at a moving target. "This is much more complicated than you might think," says Eric Garberson, Ph.D., current director of the MATX program. "With interdisciplinary programs it can be difficult because there are radically different ways of approaching the same things within the various disciplines. Sometimes there's very little overlap at all and that's part of the dilemma — determining which parts can overlap."
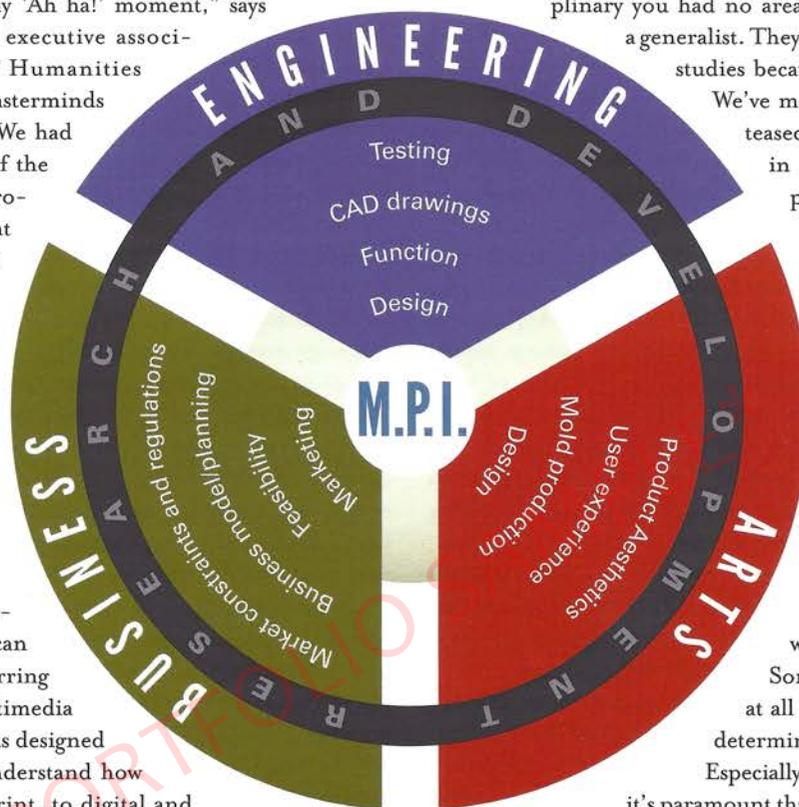
Especially at the Ph.D. level, Garberson says, it's paramount that students have a specific objective in mind before entering an interdisciplinary program.

"It's really necessary for students to be consciously aware of where they want to go and what they want to do with the degree," he says. "You need to say, with [MATX] for instance, 'I want to work in the field of mass communications, but I want to have a deeper understanding of the arts.'"

For those interested in taking this Ph.D. to the world of academia — one that continues to be driven and separated by disciplines — the move could be challenging, or it could give those holding interdisciplinary Ph.D.s added flexibility.

"It's funny, my Ph.D. is in media, art and text, which incorporates new media communication, the arts and mostly English, but I teach American studies," says **Meghan Rosatelli, Ph.D.** (Ph.D. '11/H&S), a recent graduate of the MATX program. Rosatelli earned a B.A. in English from the University of Colorado at Boulder, where she also focused on creative writing and minored in philosophy, and an M.A. in English from VCU.

"I think having an interdisciplinary degree definitely opened me up to other interdisciplinary fields, such as American studies, for instance," she says. "I find it fun to play with the boundaries of those fields." Rosatelli also found a niche for her MATX degree. She's teaching a new media research studio course, Digital America, at the University of Richmond in the spring of 2012.

ENGINEERING AND DEVELOPMENT
Testing
CAD drawings
Function
Design

M.P.I.

BUSINESS RESEARCH
Market constraints and regulations
Business model/planning
Feasibility
Marketing

ARTS DEVELOPMENT
Product Aesthetics
User experience
Mold production
Design

OPEN FOR BUSINESS

While it will be a couple of years before the M.P.I. program produces its first graduates, students who are considering enrollment say they're banking on the notion that this new form of degree will give them a competitive advantage via a unique skill set.

"The integrated nature of the da Vinci Center, and the M.P.I. program in particular, just screams, 'This is you!'" says Rion Motley, a recent graduate of Old Dominion University who studied biology. Motley plans to enroll in VCU's M.P.I. program in the fall of 2012. He also points to the iPad, and other tablet devices, as an analogy for why he sees the M.P.I. program as timely.

"These devices are the epitome of the current paradigm," he says. "One device does many things. And our workforce is destined to the same fate, with one person needing expertise across many or all areas of their field."

Poorav Shah sees the degree leading to specific roles. "I plan to pursue a leadership position in the technology field, either as a chief architect, which requires a deep understanding of technology and a good understanding of the business domain, or a chief technology officer, which requires a good view into finance in addition to technical skills," says Shah, who holds a B.S. in computer science from the University of Bombay in India and an M.S. (also in computer science) from Virginia Tech.

The program could launch others in a more entrepreneurial direction, by encouraging them to start their own companies based on ideas they bring to their studies. Taylor Whitelow, a VCU senior majoring in business, says he already has a product in mind for his M.P.I.

Photo courtesy the da Vinci Center for Innovation

Undergraduate art students lend a unique perspective of aesthetics and function to VCU da Vinci Center for Innovation projects.

project, though he isn't willing to divulge the idea just yet. "This program came along in perfect timing," says Whitelow, who plans to graduate in 2012. "I just feel that I'm an independent person, and I feel that this program will give me an opportunity to embrace that."

Kahn says that while it is by no means a requirement that students enter the program with a product or service in mind, Whitelow represents what he sees as an ideal scenario. In fact, he hopes that M.P.I. graduates will take their products to market or form start-up companies around them.

"We want students who come in with an idea, or those we help to identify an idea, to leave with a business concept or product in the end," he says. "They don't have to come in with an idea, but they need to come in with the passion to create something."

Kahn believes that VCU is especially well-suited for interdisciplinary programs, partly because of its nationally ranked School of the Arts and its School of Engineering, and "because we want to be a different type of experience; we can be cross-functional."

According to Newell, universities nationwide are witnessing a sort of interdisciplinary revolution, partly by requirement. According to Association of Integrative Studies' data, about two-thirds of U.S.-based colleges and universities now offer universitywide interdisciplinary courses. He also cites organizations such as the National Academy of Sciences, National Institutes of Health and the Social Science Research Council as proponents of interdisciplinary studies and practices.

"Ten years ago, if you used the words 'interdisciplinary process,' people looked at you like you had two heads," Newell says. On the contrary, interdisciplinary scholars would suggest that two heads are better than one.

Drew Vass is a contributing writer for Shafer Court Connections.

Interdisciplinary age

Interdisciplinary studies first appeared at VCU in 1977, following legislation passed by the Virginia General Assembly in 1972 requesting that the state's senior universities develop nontraditional degree programs. Jan. 1, 1977, five students were admitted to the newly created Bachelor of General Studies (now Bachelor of Interdisciplinary Studies) program, but within a year that number grew to more than 50.

At VCU, concepts in interdisciplinary studies often begin as minors or concentrations but later evolve into degree programs, departments or even schools. In 2002, for instance, VCU students could only minor or concentrate in public affairs and administration as an interdisciplinary blend of existing courses. In 2003, however, the School of Government and Public Affairs debuted, later becoming the L. Douglas Wilder School of Government and Public Affairs, eventually offering both undergraduate and graduate degrees. Another example is women's studies, which began as a concentration offered through VCU's B.I.S. program in 2002. That concentration later grew into an undergraduate degree in 2003 and then a full-fledged department in 2007. In 2010, the name was changed to the Department of Gender, Sexuality and Women's Studies, which now offers post-baccalaureate graduate certificates in addition to undergraduate degrees.

To view a video of student perspectives on interdisciplinary studies, snap a photo of this QR code with your smart phone.