

Technology and Integrative Learning: Enabling Serendipitous Connectivity across Courses

By **David E. Shi**, president, Furman University

Many colleges and universities are already promoting and assessing engaged learning in distinctive ways. But can we do more? In fact, can we enhance liberal learning in more fundamental ways? Can we go beyond the now widespread emphases on greater engagement and commit ourselves to the more difficult task of promoting integrative learning? With that ambiguous proposition lingering in the air, let me provide some context to buttress its premises.

A paradox confronts residential liberal arts colleges. On the one hand, the world around us is being transformed by the increasing fragmentation of knowledge; the ferocious specialization of disciplines; the tidal wave of digitally refined and delivered information; the fragmenting energies of pluralism; and the increasing scale, complexity, and fluidity of global events and threats. In short, life is more dynamic and chaotic than ever before, demanding different competencies and perspectives from college graduates.

Yet too many campuses and too many of our colleagues in the academy continue to operate largely within traditional organizational structures and routine learning environments. Inertia prevails. However, change is in the air. In recent years, a small but growing number of colleges and organizations have committed themselves to creative efforts to reinvigorate the traditional ideal of integrative learning that initially constituted the core of liberal education.

Nexia—Fostering Integrated and Connected Learning

The Association of American Colleges and Universities (AAC&U) and the Carnegie Foundation for the Advancement of Teaching have made a concerted effort over the past three years to promote more integrated and connected learning. Integrative learning as promoted by AAC&U and the Carnegie Foundation is intended to help students intentionally connect ideas and insights from various disciplines and experiences. AAC&U and the Carnegie Foundation have applauded colleges for implementing first-year seminars, thematically connected learning communities, interdisciplinary opportunities, capstone experiences in the major, digital student portfolios, and student self-assessment instruments such as journals and blogs.

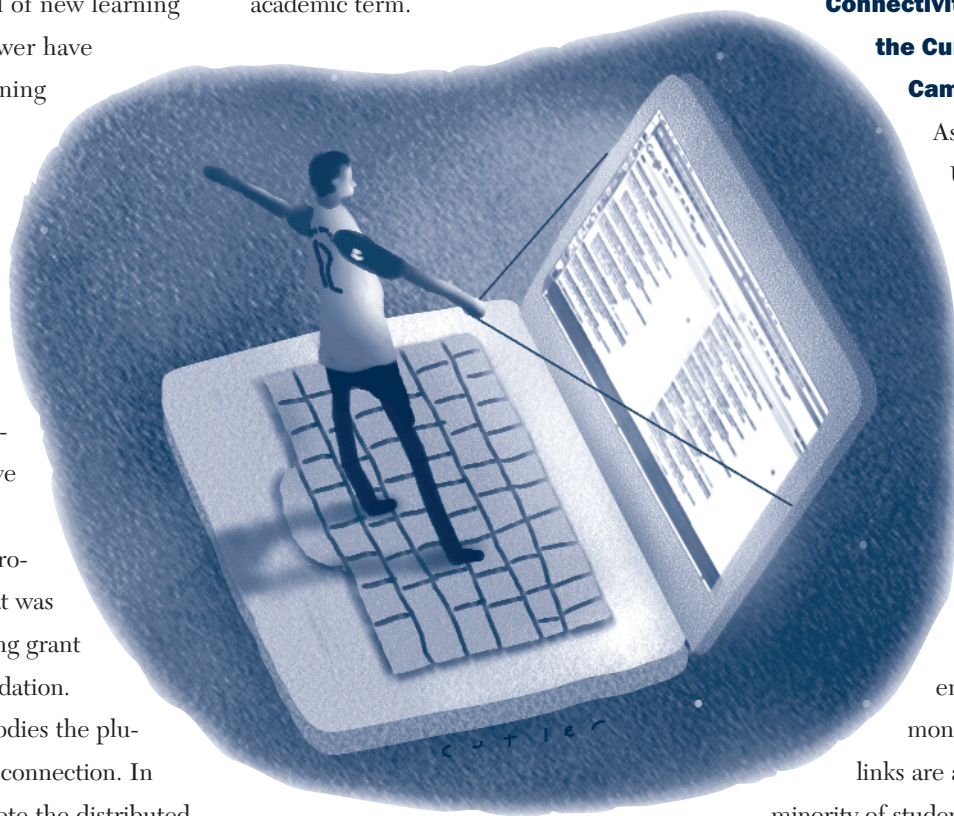
But these examples highlight one of our sternest challenges: to promote integrative learning comprehensively, over the entire span of a college experience, spatially and temporally. Rather than being satisfied with individual initiatives such as first-year learning communities and senior capstone courses, colleges need to help students make connections across learning experiences and over time. Integrative learning must be not an isolated event or exceptional curricular experience but a regular part of intellectual life—and its access portals must be readily accessible, day and night. Yet pedagogy on many campuses has not kept pace with technology. To be sure, new learning technologies have become commonplace, and the distribution of information and knowledge, as well as

the speed and frequency of communication, have increased dramatically. Dazzling new electronic resources, however, have been used primarily as “add-ons” to conventional ways of teaching and learning. Few institutions have fully embraced the strategic significance and transforming potential of new learning technologies. Even fewer have tried to yoke new learning technologies and innovative learning communities to the integrative premises of liberal education.

At Furman, we have been wrestling with such elusive possibilities. Our efforts have recently coalesced around an ambitious program we call Nexia that was stimulated by a planning grant from the Mellon Foundation. The term “nexia” embodies the plural of nexus—a link or connection. In this context, nexia denote the distributed nature of thinking within a truly integrative learning environment in which the centralizing focus of the major is deliberately complemented by links and threads of broader concern.

The Nexia concept comprises two related approaches to facilitating integrative learning within a residential liberal arts setting. The first approach is explicitly curricular and focuses on building and enhancing connectivity across courses. Like similar programs at

Wheaton College in Massachusetts, Carleton College, and the University of North Carolina–Asheville, Nexia will support faculty in designing multidisciplinary team-taught courses and forging fertile connections between separate courses that may be explored throughout the duration of an academic term.



The Nexia program is distinctive, however, in recognizing the limitations of such “designed connectivity” for nurturing the responsive, inventive nature of thinking within a fluid world that demands more nimble notions of learning and more immediate conduits of connectivity. Accordingly, Nexia’s intent is not only to support prepackaged interdisciplinary courses, but also to enable serendipitous connectivity across courses. Such ad hoc connections may be prompted by current

events, a spontaneous conversation in the faculty lounge, or a late-night residence hall conversation in which two students discover an intriguing point of convergence between discussions or readings in their respective classes.

Connectivity Conduits across the Curriculum and the Campus

As Gerald Graff of the University of Illinois at Chicago has noted, “The classes being taught at any moment on a campus represent rich potential conversations between scholars and across disciplines. But since these conversations are experienced only as a series of monologues, the possible links are apparent only to the minority of students who can connect disparate ideas on their own” (1992, 105–106).

Our Nexia concept aims to convert such conventional monologues into dialogues as well as group conversations by providing a conceptual development process and an administrative or implementation structure, both of which are necessary to enable these covert conversations to emerge within the institution. As Graff notes, discerning “the possible links” between scholarly monologues has been,

and continues to be, the missing link in higher education. How can we be more intentional in our efforts to facilitate serendipitous interactions?

The Nexia initiative fosters integrative learning through the development of a dynamic software program that mimics the functions of an air-traffic controller by assisting faculty and students in identifying and facilitating connections across the curriculum and the campus. Building on recent developments in semantic search technologies (notably from the National

keyword or other metadata-driven searches.

A significant benefit of the Nexia tool stems from its dynamic, three-dimensional graphical interface, which allows users to visualize connections through an array of filters, including faculty names, departments, courses, and specific keyword terms. The tool's potential utility extends from its immediately intended use of stimulating faculty-identified, teachable connections among courses to building dynamic, interactive

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Institute for Technology in Liberal Education [NITLE] Semantic Engine), the Nexia tool initially generates potential connections from a database of teaching- and research-related materials submitted by faculty, staff, and students. Conceptual connections are identified not on the basis of simple word-to-word matching, but through algorithms of semantic proximity, thus generating results that are more conceptually nuanced and more intellectually stimulating than those produced by simple

learning communities among students, documenting integrative learning within digital portfolios or blogs, identifying possible sources of outside funding, and developing a more flexible and responsive model of curriculum development.

For example, professors who are interested in taking part in these “meta-curricular” threads could use collaboration tools to create asynchronous discussion venues shared by all the classes involved in the thread, thus allowing stu-

dents to participate in a richer convergence of perspectives and discourses than is possible within a single classroom. In this way, a complex issue such as intellectual property, which currently has no obvious “home” in the disciplines, could be simultaneously engaged by classes in computer science, philosophy, economics, bioinformatics, music, literature, sociology, and so on. The resulting dialogue about the issue would both highlight the unique contributions of the different disciplinary voices and enable students and faculty to transcend the limitations of the traditional disciplinary structure. This sort of multidisciplinary discussion is intended to create a discursive campus environment that is much closer to the so-called real world, in which the expertise of various specialists is commingled and shared to meet the challenges of complex problems that transcend single disciplines or offices.

Institutions tend to value what can be seen, shared, and remembered. Education in general, and higher education in particular, has increasingly come to value content over context, facts over meaning, and knowledge over conversation and connectivity. The Nexia concept we are developing aims to right this imbalance by creating infrastructure and curricula that render connectivity audible on a pedagogical level and visible on an institutional level. In this regard, we view Nexia as both a heuristic device (a catalyst for insight) and a dynamic repository of information, and this heuristic power is what truly distinguishes it.

A Campus Culture of Creativity and Innovation

Such a radical shift from a content and disciplinary focus toward a more integrated, interdisciplinary emphasis and context requires shifting campus cultures, rethinking disciplinary boundaries, and reconceiving teaching and learning. Such ambitious efforts are potentially radical in their implications—and expensive. Promoting integrative learning through the use of sophisticated software requires first and foremost a campus culture of creativity and innovation. It also requires

- staffing and resources to support a more active learning community of faculty and students that transcends traditional course times and boundaries (e.g. online presence and conversations);
- staffing and resources to assist faculty with developing new cross-campus connections and instructional materials;
- faculty development programs to introduce the concept of cross-curricular connectivity;
- centralized administrative technical support and software for identifying and facilitating collaborations;
- programs to formalize and promote an institutional culture of academic engagement and collaboration (for example, essay and multimedia contests, symposia, speakers, campus-wide online discussion venues focused on various topics, an e-journal of collaboration, and so on);
- cutting-edge search and knowledge mapping technologies, resources for digitizing and archiving teaching and

research materials, and staff and resources to develop appropriate assessment tools for integrative learning.

To the extent such resources become available, the residential liberal arts colleges have the potential to move beyond being exemplars of various forms of student engagement and become beacons of integrative learning. Furman has already taken a step in this direction with the establishment of a Center for Teaching and Engaged Learning (CTEL) which is designed to increase the quality and frequency of cross-disciplinary and pedagogical dialogue within the academic community. The creation of CTEL coincides with a reorganization of the general education curriculum around perspectives or “ways of knowing”; a transition from a term-based to a semester calendar, and the establishment of a two-semester first-year seminar for incoming students designed to facilitate integrative thinking. Each of these steps alone challenges professors to reconsider their teaching strategies and redesign their courses. Together, they may prompt cultural change across the campus and promote even greater creativity and innovation.

In this regard we view Nexia as simply one of several critical tools in our efforts to encourage dynamic dialogue and cultural change. CTEL is also positioned to promote integrative learning by supporting faculty and the academic community as they rethink their courses in coming years. As potentially powerful as Nexia may be as a connective tool, its

success will depend upon the quality and extent of the conversations surrounding it. CTEL will facilitate such dialogue by providing a lively crossroads for faculty and students to engage issues and explore technologies directly related to integrative learning.

In pursuing such innovations, we will ironically resurrect one of the animating premises of classical liberal learning in its modern guise. We invite the higher education community to join us in these conversations. Rarely has the need been so compelling and the means been so available for rethinking and renewing the processes of liberal learning

Academics promoting integrative learning often quote the phrase “only connect” from E. M. Forster’s novel *Howard’s End*. Yet the usually overlooked context for the quotation serves as a more fitting coda for these reflections: “Only connect! That was the whole of her sermon. Only connect the prose and the passion, and both will be exalted, and human love will be seen at its height. Live in fragments no longer. Only connect, and the beast and the monk, robbed of the isolation that is life to either, will die.” ■

Reference

- Graff, G. 1992. *Beyond the culture wars: How teaching the conflicts can revitalize American education*. New York: W. W. Norton and Company.