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## **Beyond Courses: The Search for New Forms of Education Online**

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### Beyond Courses: The Search for New Forms of Education Online

With the course firmly established at both the secondary and post-secondary levels as the basic unit for delivering and accounting for education, it is perhaps not surprising that it has also assumed such a role online. On high school and college campuses, courses serve to structure the time and attention of instructors and students. Courses constitute the major portion of the formal educational program. Moreover, they allow for the efficient use of physical facilities by permitting schools to schedule multiple courses in any one classroom throughout the day, the week, and the term. Courses also structure educational accountability processes by allowing for assessments of student performance in each course and then by providing convenient units that may be assembled to fulfill the requirements for a diploma at the secondary level and for general education, majors, and degrees at the post-secondary level.

The course has served a number of similar functions as it has been moved online. Perhaps more than anything else, the use of the course as the unit for packaging and delivering education online has lent legitimacy to education in a non-traditional environment. However, the use of the course as the primary unit for online education has also brought some expectations that may be inappropriate or unrealistic. Courses are assumed to allow for a certain degree of interaction and for the establishment of close relations between faculty and students that may prove unattainable online. At the same time, reliance on the course as a delivery mechanism may prevent exploration of other more appropriate models.

To begin the exploration of models of online educational delivery other than the course this paper will consider alternatives, including research laboratories that can take students to the leading edge of scientific discovery, expert discussion groups that rely on broad participation, and digital libraries that organize and present content to address a well-developed conception of audience need.

#### **THE SEARCH FOR FORMS AND FORMATS IN THE APPLICATION OF NEW TECHNOLOGIES**

Before considering the particular case of the course as a unit of online education, it would be useful to take stock of where we are in the development of online education. It is safe to say that we are still very close to the beginning of the development of online education and online learning environments. This means that we have probably not yet witnessed the resolution of key questions about the most effective or appropriate, or indeed the most popular, form for online learning. Consequently, we may not yet have seen or noted what will ultimately become the dominant form of online learning.

A brief example from the early stages of another new technology will illustrate this point.

Consider the development of motion picture technology. In the nineteenth century when the technology was emerging the dominant form for its application was not the feature film projected on a screen that we know today. The most widespread early form was the kinetoscope, a single viewer peephole machine (Robinson, 1997; Balio, 1976). These very different forms existed together for some period of time before the feature film emerged triumphant.

My point in recounting this case of the emergence of a dominant form or format for the application of new technical capabilities is to sensitize us to the prospect that the currently dominant form in online education, the online course, will not inevitably prevail as the dominant mode over time.

## STRENGTHS AND LIMITATIONS OF THE COURSE MODEL

Every form of educational organization entails a combination of features that work more or less well to promote learning under particular conditions. The course model is a form that has evolved to meet the needs of secondary and post-secondary educational institutions operating in physical campus-based environments. The features of the course model have advanced to address concerns under the conditions that prevail on physical campuses. Whether the model can be successful in the online environment remains to be seen.

### Functions Served by the Course Model

To understand some of the requirements that new models of online learning must address we first consider the functions currently being served by the course model. Each of these functions might have to be addressed by alternative models if they are to prevail.

Courses serve a wide variety of individual and institutional needs in secondary and post-secondary education. First, they allow for the segmentation of the curriculum into manageable parts. This segmentation allows instructional staff for any one learning sequence to be specialized and focused. Such specialization reduces the need for staff to have broad competence in a vast area of the curriculum. Alternatively, it reduces the need to assemble complex instructional teams to cover the same broad expanse of the curriculum. The course model thus serves to reduce the complexity of instructional resources that must be mobilized.

Second, courses serve to narrow the focus that students must bring to the learning task. Such narrowing permits students to concentrate their efforts on a well-defined and bounded part of the overall curriculum at any one time. Presumably such a focus allows for more rigorous learning experiences.

Third, courses structure the time of instructional staff and students. Courses essentially place learning on a schedule to attempt to ensure that a certain amount is accomplished within a defined period of time. There are several implications of this structuring of time. The course model defines the time that will be devoted to course activities, at least those activities that require both instructor and student participation and/or interaction. Campus-based courses have associated requirements for course meetings that impose expectations and/or requirements for instruction and student performance at least to the level of attendance. In addition, courses can include requirements for time and attention outside of the required meetings.

In addition to course expectations and requirements defining the time that should be devoted to course activities, courses also function to limit or ration the time that will be devoted to a particular segment of the curriculum. Courses limit the meetings between instructors and students to a certain number of hours per week, and they limit the duration of attention to any one area of the curriculum to a certain number of weeks.

Fourth, courses also ration the use of the physical campus by designating particular times for particular course meetings. Such rationing applies not only to space on campuses, but also to access to particular instructional resources.

Fifth, courses offer a way of managing the assessment of student performance and progress. Each course enrollment results in a grade that serves as a record of the student's performance. These individual course grades provide a series of assessments that can be accumulated in a student's transcript to show the overall academic performance of a student. The course model of instruction with its required assessments and discretely scheduled learning activities anchors the assessment process and ensures that assessment takes place and that the results of assessments are communicated to students.

Sixth, in addition to allowing for the monitoring of student performance, the course model also allows for the monitoring and management of instructional delivery and the performance of instructors. At the very least courses offer educational institutions a mechanism to assign instructional responsibilities and rationalize the distribution of instructional duties among a group of faculty members.

Seventh, educational institutions often use the course as an accounting device. The course can be specified as a relatively standard unit of instruction, and then a tuition rate can be established in relation to the number of courses in which students are enrolled. For example, tuition rates can be specified in terms of a certain number of courses or in terms of a certain number of course credits. Since credits are associated with courses, the metering of tuition relies on the course model. The course is also used as a meaningful unit of student accomplishment toward a degree, and degree requirements are typically set in terms of a certain number of courses overall as well as a certain number of courses in one or more subsets (e.g., courses in a major, courses in a science, a language, etc.)

Overall, the course serves as a key element in the packaging and delivery of education. All of these functions had accrued to the course prior to the advent of online education. Even in the pre-internet era, the course served as a major organizer of distance education in the form of the correspondence course. With the new possibilities for distance education afforded by the internet, the course model migrated quite naturally to the online environment. It is easy to see why the course model is now the dominant model in formal thinking about online education. In addition to all of the functions noted above, the course model brings with it a certain legitimacy that carries over to the world of online education and makes it appear more palatable to those who might question it. Policies at many educational institutions make no distinction between courses taken through on campus attendance and those taken online, and the common unit defined by the course model is, in part, responsible for this integration of online learning activities into campus based programs and degrees.

### **Limitations of the Course Model**

Although the course model has some significant advantages for organizing educational activities and experiences and although it has come to dominate campus-based educational institutions, it also carries certain limitations that are made more manifest when it is employed in the realm of online learning. Considering these limitations may provide some insight into the requirements for any model that could serve as an alternative to the course model.

Some of the limitations of the course model are the result of the very same features that confer certain of the advantages noted above. Although the course model provides a manageable way to segment the curriculum, that very segmentation reduces the flexibility of students and instructors to pursue knowledge in precisely the way they might wish. Thus the course model mandates the presentation and sequencing of content, and in so doing it places limitations on instructor and student self-direction in learning. This limitation may not be noted much on traditional campuses where the entire environment is organized to offer learning opportunities, but it may be more problematic in the online environment where the single course is often the only educational option presented to students.

Course structure itself presents a substantial limitation that is recognizable both on campus and online. The typical course structure of periodically scheduled meetings and fixed duration sessions and terms has a logic all its own that is independent of any logic related to the content that is the subject of the course. In some instances (e.g., science labs, language labs) the course structure is configured to permit certain kinds of inquiry specific to a subject, but in general courses take the same form of meetings, assignments, examinations, and fixed length terms regardless of the content studied. When specific instructional goals are recognized as requiring particular structural configurations (e.g., discussion of material in small groups), a structural

accommodation is made, but that accommodation is often extended generically with little opportunity to organize and structure a course to enhance the educational experience in a particular subject domain. Under the course model, a course is a course is a course, and the one thing you know when you start participating is that you are in a course. That is one reason why on the first day students have to be told what course they are in to make sure they have not ended up in the wrong room. If every part of every curriculum is best taught in 50 minute segments several times a week for 12 to 15 weeks, then perhaps the course model is the best alternative. But this seems unlikely.

One of the virtues that is widely touted for online education is the fact that it offers “any time, any where” learning. However, the course model of online education imposes a rather severe limitation that is typically overlooked. Although education can take place “any time, any where,” course-based online education does not easily support “any thing” learning. That is, students must typically make a selection from a set of courses, and then they can learn only those topics that fall within the courses they have selected.

The course as a package for learning, particularly online learning, may not be the most appropriate size. Courses may be too big (e.g., too highly aggregated) to meet some learner expectations and too small (e.g., too discrete) to address other learner needs. Are courses of traditional length simply too long to be sustained online? Is the traditional course length too long to sustain maximum engagement and learning? Are traditional length courses efficient vehicles for the delivery of education? Although there may be some good reasons for courses of standard length on campuses where the physical plant operating costs are fixed and student living conditions must be maintained, in the online environment these conditions do not apply. Although there is some variation in course length online, the need to mimic campus-based offerings has curtailed the range of possibilities.

Courses have always carried some limitations for interaction, both instructor-student interaction and student-student interaction. Again, this stems from the very structure of courses as instructor-led activities in which students play a limited range of roles. This limiting property of campus-based courses is revealed when the course model is moved online and some of the factors leading to the limitations are no longer present. On campus interaction between instructors and students is limited to the time of the actual course meeting with perhaps some minimal opportunities for interaction outside of class during faculty office hours. When the course model is moved online and the natural limitations imposed by scheduled meetings are no longer present, the resulting interaction burden on faculty is quickly noted and identified, not as an escape from the limitations of the campus-based form, but as a problem that challenges all those involved in online courses.

The issue of the demands on instructors posed by moving courses online and the consequent higher expectations for interaction with students raise the more general issue of whether the course model is economically viable. This question can be considered on several levels.

In terms of the structure of a course with its heavy reliance on an instructor to provide leadership and direction, the question is what level of staffing is required to accomplish all that must be done to provide oversight, direction, and feedback to learners. This problem is made more salient when the course model is moved online both because the interaction demands tend to increase as individual students seek more connection in the absence of a general class meeting and because the course production requirements seem to call for a broader base of skills than might be available in a single instructor. Online course development teams require greater resources than instructor led campus-based courses. The expectation that higher course development costs for online courses might be recouped through the repeated offering of the same course have yet to be proven true in practice, and as knowledge continues to advance more rapidly this promise may be slipping further and further out of sight.

Beyond the structure of single course, the course model overall, seems to be more attuned to an industrial era of just-in-case learning than it is to a post-industrial era of just-in-time learning. The resources required to develop courses far ahead of the time they are needed can easily lead to waste when the anticipated demand fails to materialize. These investments were easily ignored when most of the actual investment was made by individual instructors, but as course development increasingly becomes an institutional investment, misplaced course development efforts will not be so easily overlooked. Efforts to manage the investment in just-in-case course inventories through the use of reusable learning objects are an attempt to reduce the investment risk somewhat.

The two levels of analysis of the costs of the course model interact in an interesting and no less problematic way. The major course development strategy for escaping the costs of the overburdened instructor or instructional team is the heavily developed course with more sophisticated instructor-free learning opportunities. However, such heavily developed courses, at least in their current form, often result in educational experiences that allow for little learner autonomy or input. Such models may have even more negative consequences for learner engagement and motivation than campus-based courses with structures that minimize learner interaction.

So, with all of the limitations attendant on the course model, the time may be right to ask if the model itself is viable online. Efforts to make the course model work online may be doomed to failure. Perhaps the course is more like the kinoscope than it is like the feature film? If that is the case, then we must ask, what are the alternatives to the course model for online learning?

### **ALTERNATE MODELS FOR ORGANIZING LEARNING ONLINE**

In considering models to guide our thinking about the organization of learning online it is useful to specify at least three major approaches distinguished by different aspects of the knowledge development and utilization cycle. One approach emphasizes the development or creation of knowledge; a second approach stresses the transmission of knowledge; and a third approach focuses on the application of knowledge. These approaches provide contexts and logics for organizing curriculum and instruction. Let's consider each in turn.

#### **The Knowledge Creation Model**

The knowledge creation model focuses attention on the processes by which particular kinds of knowledge are created and uses these processes as organizing principles to structure curriculum and instruction. Knowledge creation models might rely on the organization of knowledge creation contexts for additional guidance on the constitution of learning experiences.

Examples of the use of the knowledge creation model arise from time to time in general discussions of curriculum. Many of the curricular reforms of the 1960s were designed to move curriculum and instruction in the direction of knowledge creation models as educators were advised to "teach math from the mathematician's perspective" and use the discovery principles of scholars to organize instruction.

In traditional secondary schools it is difficult to simulate entirely the knowledge creation process and context. Post-secondary institutions that are also research oriented have an advantage because the site of education is also the site of research and discovery. However, even in research universities there is a separation of research from instruction that makes it sometimes cumbersome to employ the knowledge creation model. The communications and computing environments available online offer new opportunities for employing the knowledge creation model to organize learning.

#### **The Knowledge Application Model**

The knowledge application model draws its organizing principles from the contexts in which knowledge is applied and from the processes of its application. This approach entails anticipating how students might apply knowledge and then using the processes and conditions of its application to guide the conduct of instruction.

This approach has been represented in efforts to shift educational programs and institutions to become applied. It is also consistent with long-standing concerns that education become more reality-based or real-world centered (Coleman, 1974).

A number of instructional strategies used in traditional educational settings are consistent with the knowledge application approach. For example, the project method seeks to engage learners in realistic projects that have currency in the out-of-school world (Kilpatrick, 1918). Problem-based learning, an approach that is increasingly popular in post-secondary settings, also draws heavily on the logic of knowledge application to organize and orient learning (Bridges, 1992; Wilkerson, and Gijsselaers, 1996). Scenario-based learning, a strategy that relies on simulations to help students step through and internalize knowledge also draws much of its logic from knowledge application settings (Kindley, 2002).

### **The Knowledge Transmission Model**

The knowledge transmission model is the model that dominates formal education. It takes its central features from the demands for transmitting knowledge and thus underlies most current educational programs and institutions. It places emphasis on the requirements for transmitting knowledge to learners.

The knowledge transmission approach organizes instruction to meet the needs of the educating organization with some attention to a general understanding of learners. The transmission approach, while attempting to address the nature of knowledge and the nature of the learner, places primary emphasis on the conditions under which knowledge can be transmitted in educational settings.

The course model is a primary element of the knowledge transmission approach for secondary and post-secondary education. As noted earlier, the course has dominated the organization of educational activities in campus-based institutions.

## **EXAMPLES OF ALTERNATIVE MODELS FOR ONLINE LEARNING**

In view of the limitations of the course model for online learning, it is important to begin to consider the creation and development of alternatives. Such alternatives are taking shape even now, and their future development may lead to their emergence as primary vehicles for learning online. Here we consider examples representative of the three approaches – knowledge creation, knowledge application, and knowledge transmission – outlined above.

### **Knowledge Creation Examples**

Since the internet and the web were originally tools developed for researchers it is not surprising that such scholars have continued to make heavy use of online environments to accomplish much of the communication and collaboration that is increasingly at the heart of their work. The online sites and tools that serve as the infrastructure for such collaboration could also serve as the sites for online learning for audiences beyond those scholars who are centrally involved.

A wide variety of online sites could serve this educational function. Some of these sites are the online homes for research centers and institutes of various kinds, sometimes at educational institutions such as universities, at other times at research organizations such as government laboratories or non-profit or for-profit consulting firms. Creating new educational venues

associated with these institutions or enhancing the educational value of existing online sites could be important first steps toward transforming these knowledge creation entities into leading destinations for online learning. Connecting learners to the resources and communities associated with these online locations would provide learners with front-row seats at the leading edge of knowledge creation.

A particularly intriguing example is offered by the research collaboratories (Committee on a National Collaboratory, 1993). These online environments combine tools for communication and collaboration with resources, datasets, and tools for monitoring and managing research online to allow widely scattered researchers to work together and make use of the facilities of some of the best laboratories in the world. These distributed research networks can offer an online view of work at the frontiers of scientific investigation to anyone with a network connection. Although collaboratories have arisen to address the needs of researchers, they can be oriented to allow for participation by students (Myers, Chonacky, Dunning, and Leber, 1997). The Bay Area Science Learning Collaboratory (Kahn and Rockman, 2002) that links science-technology museums to middle school science teachers is an example of an effort to bridge the world of k-12 education and research.

Online academic journals represent another research or knowledge creation oriented online form that could be enlisted for educational purposes. Such journals are emerging both from existing print-based publications that are moving their operations online and as totally new entities created specifically for the online environment. Although academic journals differ widely in the degree to which they see their missions as encompassing education, there are journals that are adopting educational missions and developing the corresponding tools to implement those missions.

Educational oriented publications can include features that are more explicitly geared for new comers to a field as well as interactive discussion boards that allow novices and experts to exchange questions and answers about major topics in a field (Natriello and Rennick, 2003).

### **Knowledge Application Examples**

While online entities such as collaboratories and journals are oriented by the knowledge creation process, other online forms with educational potential are oriented by the application of knowledge. These online sites exhibit a form and an organizational structure that is tailored to the conditions of those faced with the task of applying knowledge. Such sites, for example, are often operated and managed by those who are users of a particular kind of knowledge. Many of the activities involve acquiring existing knowledge and using it to address a particular problem or task.

Expert user communities are one example of online learning sites that exhibit the features of the knowledge application model. These communities bring together disparate groups of people who share a common need to apply a particular kind of knowledge, often in the course of their daily work. For example, ASP Today <http://www.asptoday.com> is an online site for web developers that offers short articles on solutions to common web programming problems. Dev Guru <http://www.devguru.com/> covers the same topics through a series of online tutorials. A more collaborative member-driven approach is taken by Experts Exchange <http://www.experts-exchange.com/>, a site that holds questions and answers all contributed by the more than one million IT professionals who are members of the site. The database of information on the site currently holds more than 500,000 items. Sites such as these offer knowledge that is directly and immediately related to the needs of students/members. They are the most recent descendants of earlier online communities such as The Well (Hafner, 2001) and of the ubiquitous Usenet newsgroups (Hauben and Hauben, 1997). All of these variations suggest the potential to develop a broad range of online knowledge application venues.

### **Knowledge Transmission Examples**



There may also be alternatives to the course model that follow the logic of the knowledge transmission approach. Such alternatives would be organized and oriented neither to knowledge creation settings nor to knowledge application settings. Like schools and like courses, they would draw their direction from the requirements for the effective transmission of knowledge.

One promising form consistent with the knowledge transmission tradition is the digital collection or digital library. Digital libraries have received increasing attention in recent years (Borgman, 2003), and they are the subject of investment by the government as well as by institutions that conceive of them as natural extensions of brick-and-mortar libraries.

Digital libraries are not yet securely anchored in the new online world, and their future is decidedly uncertain. For the moment they seem most likely to be associated with physical libraries, but that could change. One possible educational role for the digital libraries format would be as content collections in particular areas of study. Such collections could be focused on programs, and they could serve as the broad ground on which "courses" might be executed. In this scenario courses would regain their role as paths through content areas. The difference would be that courses offered online in the context of broader digital libraries would permit instructors and students to alter directions of study as they choose to pursue any of the many possible paths through an area.

### CONCLUSIONS

Collaboratories, online journals, expert user communities, and digital libraries might all become viable alternative forms for online education to rival the course. To emerge in this way will require any of them to address at least some of the functions that are currently served by courses or at least to offer a better balance of functions and limitations. Addressing issues such as financing, assessing, and certifying educational experiences online are certainly not trivial, but each might be accomplished in some way outside of the traditional course format. Only time will tell whether the online course is the "kinetoscope" or the "feature film" of online learning.

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