

Supply and Demand Issues for a Convenience Learning Course*

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Abstract

Supply and Demand Issues for a Convenience Learning Course

This paper explores and analyzes supply and demand of university-level convenience learning courses. Procedures involve use of microeconomic theory to conceptually analyze supply, demand, benefits and costs and a case study comparison of a traditional course to a convenience learning course that has been offered for three years.

Supply and Demand Issues for a Convenience Learning Course

Will higher education of the future be more demand driven or more supply driven than higher education today? Will emerging educational and communications technologies dilute geographical market power traditionally enjoyed by state universities? The authors of this paper anticipate “more demand driven” and “yes.” Factors such as technologies that eliminate or decrease distance and scheduling constraints, increasing costs of access to traditional locations of instruction, opportunity costs of time and schedules, and desire for autonomy suggest that future students will desire and exercise more power to choose how, when, and where they will achieve their educational goals. Large increases in the number of “distance” learning courses and programs are projected (Weldon, Covington, Long, and Connor). However, in this paper the term “convenience” rather than “distance” is used because removal of distance barriers is only one of the factors that may make a course more accessible.

Despite the potentially rewarding opportunities associated with convenience learning, there is considerable controversy associated with making degrees and courses more accessible to more students (e.g., USA Today, Burgan). Some members of society are enthusiastic about a more competitive market for higher education. However, considerable concern and anxiety exist among faculty because of issues such as fear of being replaced by a distance educator, quality of the educational experience and high opportunity costs (e.g., less research output) associated with making a course more accessible.

The agricultural economics profession has much to contribute to understanding this controversy. Economic theory provides an analytical framework for analyzing benefits and costs. Theory of markets provides insights into factors affecting the supply of and demand for educational experiences.

The purpose of this paper is to explore and analyze the benefits and costs of university-level convenience learning courses. The focus is on courses that may be used to fulfill on-campus degree requirements and are also offered as traditional on-campus courses. Procedures involve use of microeconomic theory to conceptually analyze supply, demand, benefits and cost. Conceptual models will be presented from the point of view of students, faculty, and administrators. Conceptual analyses will guide an empirical analysis (case study) of a Kansas State University convenience learning course that has been offered during the last three years.

Individual Faculty Member's Supply of Convenience Learning

The first issue to consider is whether the planning horizon is long run or short run. That is, are some inputs fixed and some variable or are all inputs variable? Given the high costs of developing or repackaging a course, a faculty member who decides to produce a convenience learning course would likely plan to offer the course several times. At first glance, this suggests a long-run planning horizon with all inputs variable.

However, if the individual faculty member holds a Ph.D. and is teaching at a university, certain inputs are fixed even if a decision is being made that will affect production over multiple years. The most notable fixed inputs are the faculty member's graduate training and general work

environment. Most Ph.Ds. in agricultural economics who work at universities in Departments of Agricultural Economics will continue to be agricultural economists whether they teach a convenience learning course or not. Although they will continue to learn and grow, their profession is fixed by their graduate training and employment. Also, although various strategies may be developed for providing release time and other resources to start a convenience learning course, the release time will usually be limited and other responsibilities and criteria for annual evaluations will likely not change much. For example, if student evaluation of courses is a major criterion for evaluating teaching, then teaching a convenience learning course will not help a faculty member's annual evaluation of teaching if student evaluations are low. Thus, although the decision to produce a convenience learning course will likely affect a faculty member's teaching over multiple years, the planning horizon is short run because some inputs are fixed.

Economic theory suggests that the individual producer's short run supply curve is the marginal cost curve above average variable costs. Wilson mentions that distance educators reported that development of distance courses is three to four times more expensive and they require three to eight times more faculty and support personnel to operate than on-campus courses. So what affects the marginal costs of offering a convenience learning course?

Marginal costs are derived from the production function and the cost of the inputs. For most faculty the major and most relevant cost is the opportunity cost of their time. Burton observed that opportunity costs of a faculty member's time are affected by the level of productivity in other activities. The issue of high opportunity cost of faculty time used for startup may be partially dealt with by providing release time from other activities. For successful courses, startup costs may be

spread over multiple semesters and a large number of students. However, more important than startup costs are the variable costs of maintaining and offering a course after the startup costs are sunk and release time is likely no longer available. Faculty time for both start up and operating may be reduced by provision of support facilities and support personnel.

Economic theory also suggests that quantity supplied is a function of the price of the output. Assuming salaries will not be reduced, faculty receive “payment” for activities in currencies such as annual merit raises, personal satisfaction, and promotion and tenure for lower ranked faculty. Thus, the quantity of convenience learning courses supplied by university faculty will depend on how such teaching is rewarded relative to how competing activities are rewarded by the university administration (e.g., raises) and by the university culture (e.g., faculty votes for promotion and tenure (e.g., Kiernan)). Within the context of the administrative and cultural environment, the quantity of convenience learning courses supplied by university faculty will also depend on the level of success and satisfaction derived from teaching such courses relative to success and satisfaction associated with competing activities.

The supply of convenience learning may be shifted by changes in technology, support personnel, professional development, university policies, and university rewards and culture. Obviously, increases in the quantity and quality of support personnel, merit raises, and favor of those who vote on promotion and tenure will shift the supply of convenience learning downward and to the right. Professional development invested in convenience learning will shift the supply curve of convenience learning courses to the right; whereas professional development invested in other activities will shift the supply curve to the left by increasing opportunity costs. Changes in policies

such as course ownership may encourage or discourage convenience learning course production (e.g., Carnevale, May 12, 2000). The impacts of changes in technology are not so obvious. If the changes facilitate teaching convenience learning courses, supply will shift to the right. However, if changes in technology require that startup costs be incurred again, supply will shift to the left. To the extent that there is risk and uncertainty associated with factors that affect supply, the risk and uncertainty will shift the supply curve upward and to the left relative to where it would be with certainty.

University Administrator's Supply of Convenience Learning

Similar to individual faculty members, university administrators are decision makers who manage both fixed and variable inputs and, therefore, operate in the short run; and their marginal costs above variable costs for production of convenience learning courses is profoundly affected by the opportunity cost of faculty time. They differ from faculty in that they have greater opportunities to shift the supply curve. For example, if an administrator makes a strategic decision to increase output of convenience learning relative to output of competing activities, he or she can hire and reward faculty who have the training, skills, and preferences to develop and teach convenience learning courses. The administrator can also invest in facilities (e.g., technology) and personnel to support faculty involved in convenience learning. Considering quantity supplied as a function of price, in addition to merit raises and personal satisfaction, administrators may also be responsive to (i.e., paid by) recognition for and survival of the institution (e. g., department or university).

With the current entry of for-profit firms that do not have the fixed and maintenance costs of

traditional universities, the learning industry's long-run supply of convenience learning is an important topic. Traditional university administrators are understandably concerned about market share and survival. Recent and emerging changes in technology may result in learning becoming a decreasing cost industry. This would have major impacts on market structure, most likely leading to a fairly concentrated industry.

Individual Student's Demand for Convenience Learning

The individual consumer's demand curve is derived by maximizing utility subject to a budget constraint. For purposes of this paper, the budget constraint represents spending total income on convenience learning or other goods and services. So what preferences would determine the utility function for a consumer of convenience learning? To start, let's examine the two-word focus of this paper, "convenience learning." Ideally the consumer should have a preference for "learning." There may be a few consumers who will take a course for the "joy of learning" rather than to enhance a career. Less ideally the preference is probably for a formal learning experience that the consumer believes will contribute to finding employment and/or enhancing success in a career. For consumers who plan to seek employment the learning experience will need to be documented (e.g., university transcript) and more often than not the consumer will be accumulating a set of documented learning experiences (i.e., courses) to complete a degree. For consumers who do not anticipate a change in employment, documentation may not be as important and they may find non credit courses acceptable.

The other major preference that would determine the utility function for a consumer of

convenience learning is a preference for “convenience.” Major issues associated with convenience are location and schedule. Technologies available today provide various opportunities to distribute learning to disperse locations. Asynchronous course activities (e.g., lectures on video tape) allow consumers to complete course work at times that do not conflict with other activities. In addition to preferences for how courses are mediated students respond to relative prices. At Kansas State University for example, out-of-state students can select convenience learning courses because they do not have to pay out-of-state tuition for courses taken through the Division of Continuing Education. Adult learners employed in locations far from universities may prefer traditional classroom learning; but they may select convenience learning to avoid the cost of travel or relocation. Traditional students who have lived with their parents may have a strong preferences for “going away to school” rather than staying at home and taking convenience learning courses. Parents who are financing their education may share this preference. However, on-campus students may prefer individual convenience learning courses that fit their schedules better than on-campus courses. For degree seeking students, on-campus and convenience learning courses may be complements or substitutes, as students seek an optimal combination of courses required.

This discussion is based on the assumption that convenience and on-campus courses have identical quality. Quality of convenience learning is a significant concern (e.g., Carnevale, Apr. 7, 2000). A faculty member who offers the same course on-campus and via convenience learning can work to ensure that content and measures of performance (i.e., grades) are the same for both. However, similar content and grading for two types of instruction do no necessarily ensure that the learning experience for both is identical.

Comparative Costs and Benefits of An On-campus and Convenience Learning Course

One of the authors of this paper has taught an on-campus farm and ranch management course (AGEC 308) at Kansas State University each Fall Semester since 1984. During 1997 through 1999, the same course was offered as a convenience learning course; 144 students from 14 states and 38 locations in Kansas have enrolled. Startup costs for the convenience learning course are reported in Burton. For course content see Burton, Schurle, Williams, and Brester; for characteristics of on-campus students see Burton and Kurdieh; and for the convenience learning course see <http://www.dce.ksu.edu/dce/as/farm.html>. This course provides a case study for comparing benefits and costs of convenience and on-campus learning. Revenues and costs (Table 1), student evaluations (Table 2), and observations of the authors provide a basis for implications (or at least hypotheses) about the supply and demand for convenience learning courses.

AGEC 308 and the Individual Faculty Member's Supply of Convenience Learning

For AGEC 308 lectures are available on video tape and audio tape. So when offering the convenience learning course the instructor does not invest time in preparing and delivering lectures. Also, the enrollment in the convenience learning course has been much smaller than the enrollment in the on-campus course. Consequently, the total faculty time required per semester to offer the convenience learning course has been much less than the time required to offer the on-campus course (Table 1).

In terms of job responsibilities, the instructor of AGEC 308 traded teaching another on-campus course one time per year for teaching the convenience learning course twice a year (Fall and

Summer Semesters). The three-year average time used to teach the convenience learning course was 245 hours, compared to the three-year average of 222 hours to teach the on-campus course. So in terms of time required for annual job assignments, so far, trading teaching a different on campus course once for teaching a convenience learning course twice was not very costly in terms of time. The original plan was to offer the convenience learning course three times per year. However, after the convenience learning course was offered three times during 1997 it became apparent that offering the course three times was much too time consuming.

So far the average time required to teach the convenience learning course twice has not been much larger than the time required to teach an on-campus course. However there are additional concerns regarding the time requirements. First, 309 hours of startup costs were required for the convenience learning course (Burton). Although release time was provided for convenience learning course development (the instructor taught one instead of two on-campus courses Fall Semester 1996), the time required to set up the course was 87 hours greater than the 1997-99 average time required to offer AGECE 308 on campus. Also, little maintenance of video and audio taped lectures has been done since they were completed in 1997. Future revisions, which may be needed soon, may be costly in terms of time.

Comparing the total time spent tells only part of the story. Looking at the time spent per student provides another perspective on the cost of offering convenience learning courses. The time per student used for convenience learning teaching has been about three to four times higher than the time used for on-campus teaching (Table 1). These higher costs for the convenience learning course are mostly time required for communications with students.

Two factors contribute to large communications costs. First, when an instructor does not meet with the class three times a week, as is usually the case with a 3-hour on-campus course, careful and frequent communications with students are necessary to ensure that students are aware of course procedures, to encourage students to complete course work on time (grades are normally reduced on exercises handed in after the due date), and to answer questions. A large portion of these communications are asynchronous and with individuals.

The second factor that contributes to large communications costs is that often non traditional students require more time than traditional students. Students with families and career responsibilities are more likely than traditional students to have crises for which exceptions to exercise due dates and postponement of tests (requiring preparation of makeup tests) are warranted. Also, some adult students are especially eager learners who ask good questions that take extra time to answer. The instructor of AGEC 308 has enjoyed most of the extra communications with convenience learning students and, on the average, has become much better acquainted with convenience learning students than with on-campus students. However, although the data in Table 1 suggest that there may be some economies of class size in per student costs of convenience learning, increases in enrollments in the convenience learning course could greatly increase the faculty time required. More information is needed about the time required to teach a convenience learning course relative to an on-campus course when content, measures or performance, and enrollment are the same for both.

Rewards might affect the supply of convenience learning. For some, outputs such as disciplinary refereed journal articles and grantsmanship may be more likely to increase the level of

merit raises than teaching a convenience learning course. In some cases, teaching a convenience learning course and using innovative teaching techniques, along with publishing articles related to teaching, may enhance possibilities for promotion. Personal satisfaction can accrue as a result of trying something new, succeeding at it, and interacting with eager convenience learning students. However, personal satisfaction is a currency similar to confederate money after the U.S. Civil War. It generally cannot be exchanged for goods and services. In the short term these benefits may be major incentives to offer convenience learning courses. But in the longer term other rewards may need to be in place to sustain efforts, because working in this area may no longer be innovative.

Concerning resources that might shift the supply of convenience learning courses, the instructor has had a graduate teaching assistant (GTA) who helped with grading during the Fall Semesters. Summer Semester 1999, the instructor used funds, that had come to the Department of Agricultural Economics from the Division of Continuing Education for teaching the convenience learning course, to hire a GTA. The Summer GTA not only helped with grading but also helped with communications with students and preparing teaching materials for Fall Semester. Based on the 1997-1999 data, the reduction in faculty time required for teaching AGEC 308 because of the Summer 1999 GTA was small. However, other benefits of the Summer 1999 GTA include a worthwhile experience for the GTA, increased access to help with the course for students, and the opportunity for the instructor to travel for about three weeks during the semester with little (if any) impact on the students. Competent GTAs that reduce faculty time required and increase faculty personal satisfaction will increase individual faculty members supply of convenience learning courses.

AGEC 308 and the University Administrator's Supply of Convenience Learning

At the university level, some administrators at KSU seem very excited about convenience learning. Technological and administrative support is available through the Division of Continuing Education. A university-level Task Force on Distance Learning has recently completed a report (<http://www.ksu.edu/provost/distan1.htm>). Concerns about the quality of distance learning experiences have been expressed. Given the decentralized university administrative structure, with salary and raises generally determined at the department and college level, it is not possible to make a general statement about the level of rewards.

On the average, AGECE 308 revenues appear to be covering direct costs (faculty salary not included) recorded by the Division of Continuing Education (Table 1). Based on three years of data, the AGECE 308 convenience learning course is much more expensive, much less efficient, and much less profitable than the traditional on-campus AGECE 308 course. A large portion of the students who have taken the convenience learning course probably would have taken the on-campus course if the convenience learning course had not been available. This observation and enrollment data suggest that the convenience learning course is competing with the on-campus course and is making it less efficient in terms of cost per student. Smaller enrollment in the on-campus course and development and teaching of the convenience learning course may be improving the quality of the on-campus course.

In the environment at KSU, the supply of convenience learning courses is growing rapidly. Even though the number of convenience learning courses is small relative to the number of traditional on-campus courses, there is likely to be continued growth in the number of convenience learning

courses in the future.

AGEC 308 and the Individual Student's Demand for Convenience Learning

Students who have taken the convenience learning course can be grouped into traditional and non traditional categories. The majority of the students have been traditional on-campus students who were working on a degree at KSU. The non traditional group has been more diverse. Examples of non traditional students include mid-career farmers, people in other careers who have an interest in farming, and a high school student who attended KSU after taking the convenience learning course.

Fall semesters both the convenience learning and on-campus courses have been offered. Based on enrollments (Table 1), when both types of instruction are available, most students prefer the on-campus course. Quantity demanded of the Fall Semester on-campus course has averaged almost nine times as many students as the Fall Semester convenience learning course.

The quality of the two types of learning may affect demand. Looking back on the first time the convenience learning course was offered, Spring Semester 1997, the author suspects that some of the students may have expected the convenience learning course to be easier than the on-campus course. The grade distribution was low relative to grade distributions before and after Spring 1997. Students who preferred an easier course may have been disappointed. Some students who have taken the convenience learning course have shared with the instructor that they learned that they prefer and expect they would have performed better in the more synchronous, traditional, on-campus course.

A major goal of the instructor has been for the content and grades for the course to be consistent whether the course is taken on campus or via convenience learning. Consequently, each Fall Semester the instructor uses the same handouts and exercises packet, schedules tests on the same dates, and gives the same tests to both convenience and on-campus students. Based on three-year average responses to student evaluation questions that might affect demand, the Fall Semester convenience and on-campus courses and the attitudes of students who select one or the other are very similar (Table 2). Level of interest in the class is identical and there is little difference in how hard students worked. Amount learned and teacher effectiveness are higher for the convenience learning course; but the differences are small. Differences in pace of the class, level of difficulty, preparation time required, overall rating of the course, and whether the students would recommend the course to others are even smaller.

Summer Semester only the convenience learning course is offered. The three-year average enrollment in the Summer course is twice as large as the average enrollment in the Fall convenience learning course. A large portion of the Summer students appear to be traditional on-campus students who take AGECE 308 while they are home (or away from campus doing other things such as an internship) during the summer. There are differences between the Summer and Fall student evaluations. Although level of interest for Summer students is about the same as interest of Fall students, on the average, the Summer students felt that they worked harder. Compared to Fall students, Summer students thought they learned more and found the teacher to be more effective. Level of difficulty, preparation time required, overall rating of the course, and percent who would recommend the course to others were all larger for Summer students than for Fall Students.

The same course content is covered Fall and Summer Semesters; but the Summer Semester is shorter. The Fall Semester lasts about 16 weeks and most of the course content of AGEC 308 is covered during the first 14 weeks. The Summer Semester for AGEC 308 lasts about 11 weeks and most of the course content is covered during the first 8 weeks. The faster pace for Summer Semester may explain why students thought they worked harder, went at a faster pace, faced a more difficult course, and spent more time preparing in the Summer. But it does not explain why Summer students are more positive toward the course and the instructor.

Three possible causes come to mind. First, the lighter teaching load in Summer may allow the instructor to be more responsive to students than in the Fall when total average enrollment in both AGEC 308 courses has been about 120. Also, Fall Semester 1999 the instructor taught a second on-campus course in addition to teaching the AGEC 308 courses. Second, on the average, the students who choose to take AGEC 308 Summer Semester may be more ambitious and more motivated than Fall Semester students. Third, students may work harder and learn more in Summer when they are likely taking fewer courses than they would in the Fall. Despite more favorable student evaluations for the Summer convenience learning course, based on three years of enrollment, the quantity of traditional on-campus instruction demanded Fall Semester is more than four times as large as the quantity of convenience learning instruction demanded in the Summer.

Conclusions

This paper uses microeconomic theory and three-years experiences and data from a Farm and Ranch Management course (AGEC 308) at Kansas State University to analyze the supply and

demand for convenience learning courses. The term “convenience” rather than “distance” is used because removal of distance barriers is only one of the factors that may make a course more accessible. The major determinants of the supply of convenience learning courses by individual faculty members are the opportunity costs of their time and the related issue of how developing and teaching a convenience learning course is rewarded relative to other activities. University administrators should also be concerned about the opportunity costs of faculty time. However, university administrators have greater opportunities to shift the supply of convenience learning courses by investing in resources that support convenience learning (or by investing in other resources) and by rewarding production of convenience learning (or by rewarding other activities). The demand for convenience learning courses will be affected by consumers preferences for convenience and the costs of convenience learning courses relative to traditional, on-campus courses. Key factors that affect convenience are location and schedules.

The three-year case study of AGEC 308 indicates that faculty time per student is much higher for the convenience learning course and that revenues are much higher for the traditional on-campus course. These two factors favor supply of traditional on-campus courses over supply of convenience learning courses. Student gave a higher overall rating for the Summer Semester convenience learning course than either the Fall Semester convenience learning course or the Fall Semester traditional on-campus course. However, quantity demanded (i.e., enrollment) of the Fall Semester traditional on-campus course is more than four times greater than quantity demanded of the Summer Semester convenience learning course. When both types of instruction were offered Fall Semesters, the quantity demanded of the Fall Semester traditional on-campus course is almost

nine times greater than quantity demanded of the Fall Semester convenience learning course.

The limited data available related to supply and demand for AGEC 308 favor the traditional on-campus course over the convenience learning course. This will not necessarily be the case for all convenience learning courses and programs. However, the data on AGEC 308 suggest that if resources become more limited than they already are, the AGEC 308 convenience learning course should be cut before the on-campus course. Burton noted that there are significant economies of scope associated with offering the same course via convenience learning and on-campus instruction during the same semester. For example, the three-year average of the marginal costs of faculty time for offering the AGEC 308 convenience learning course, given that the on-campus course will be offered, was 34 hours (see footnote d of Table1). So offering the convenience learning course by itself Summer Semester is particularly expensive. In fact, because the instructor needs time for other activities, the AGEC 308 convenience learning course will not be taught Summer 2000.

However, over the next few years the convenience learning course will probably continue to be offered for some of the following reasons. First, resources are currently committed to it and the course is going well. Second, based on communications with students, the convenience learning course has been deeply appreciated by some students who either did not have access to the on-campus course or found the convenience learning course to be more convenient. Thus, good will has accrued, and, although difficult to measure, good will has value for a public institution of higher learning. Finally, demand for convenience learning may increase or changes mentioned above may reduce the costs of convenience learning and shift supply to the right. Therefore, there is a chance

that the future will favor convenience learning. If it does, there may be some advantages to having an on-going convenience learning course, such as AGECE 308, in place.

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Table 1. Three-Year Average Revenues, Direct Costs, and Faculty Time Associated with Teaching a Farm and Ranch Management Course at Kansas State University, 1997-99

Item	Convenience Learning		On-Campus
	Summer	Fall	Fall
No. Students	24.33	12.33	108.00
Revenue (\$)	\$8,299 ^a	\$4,670 ^a	\$33,788 ^b
Direct Costs (\$)	\$4,870 ^c	\$4,256 ^c	Unknown
Faculty Time (hrs)	149	96 ^d	222 ^d
Revenue per Student (\$)	341	379	313
Direct Costs per Student (\$)	200	264	Unknown
Faculty Time per Student (hrs.)	6.11	7.76	2.06

^a Revenue for the convenience learning course included tuition, library, and tape fees. Revenues and costs were updated to a March 2000 price level before averaging.

^b Revenue for the on-campus course was estimated by multiplying resident tuition and fees for a 3-hour undergraduate class by the number of students who received a grade.

^c For convenience learning, the Division of Continuing Education recorded payment to the instructor's department, travel, printing, postage, and miscellaneous expenses. Similar costs incurred by the agricultural economics instructor were not recorded.

^d Fall Semesters an average of 62 hours were spent on activities shared by the on-campus and convenience learning course; 34 hours on activities for the convenience learning course only; and 161 hours on activities for the on-campus course only. These totals do not include 80 hours invested in computerized practice exercises and tests that were used in both.

Table 2. Weighted Average of Selected Questions from Student Evaluations of a Farm and Ranch Management Course at Kansas State University 1997-99 (Very Low = 1 ... Very High = 5)

Item	On-Campus		Distance Learning
	Fall	Summer	Fall
Average Number of Respondents ^a	66	20	6
Strong Interest of Students in Class	3.58	3.61	3.58
Students Worked Hard to Learn	3.56	3.92	3.66
Amount Learned	3.48	3.92	3.62
Teacher Effectiveness	3.57	4.10	3.87
Pace of Class (1=too slow ... 5=too fast)	3.07	3.59	3.11
Level of difficulty of the course (1=too easy ... 5=too difficult)	3.08	3.37	3.06
Preparation time required compared to other courses (1=less time ... 5=more time)	3.09	3.41	3.06
Your overall rating of the course	3.48	4.05	3.39
Would recommend course to others ^c	85%	93%	88%

^a When averaging, responses were weighted by the number of respondents each semester. This procedure is not perfect because a few students omitted individual questions.

^b This question was meant to be answered “yes” or “no.” A few students each semester marked something other than “yes” or “no.” Percentages reflect the number of “yes” responses relative to the total number of “yes” and “no” responses.