

## Course Selection Across Three Decades as a Measure of Curriculum Change

Researchers who compared Nebraska high school curriculums between 1953 and 1983 have developed a model readily adaptable to individual districts desiring a more informed basis for decision making.



Are students in your district taking fewer academically demanding courses than students of a decade ago? How well are past and recent graduates of your school "making it" in the postsecondary world? What curriculum changes are likely to create positive short-term outcomes as well as lasting consequences?

These are a few of the questions we set out to answer in our recent study of curriculum changes in 20 Nebraska high schools between 1953 and 1983. Our study was motivated by the plethora of reports issued between 1982 and 1984 demanding educational reform. Too often in these reports, the critics of secondary education lack dependable evidence about the courses offered in our schools, the courses students actually take, and the relationship between courses taken and educational outcomes—all information essential to informed decisions.

The purposes of our study were to (1) present data on changes in course offerings between 1953 and 1983, (2)

report impressions of veteran teachers and school patrons with respect to curriculum changes over the same period, and (3) develop a model that local districts could use to make historical assessments of curriculum changes and outcomes for their own schools.

For each of the 20 schools we drew a random sample of graduates for the years 1953, 1963, 1973, and 1983. The sample for each school included 10 percent of the graduating class or 10 graduates, whichever was greater. This procedure yielded a sample of well over 200 students for each of the four years studied and a total of 991 students. We analyzed data from student transcripts for each of the last eight semesters of high school work. In addition to course titles and course grades, we searched transcripts for standardized test information. Student anonymity was assured.

### Changes in Courses Studied

One fundamental question we sought to answer was how patterns of courses had changed from 1953 to 1983. Figure 1 summarizes the courses taken in

each major curriculum domain by the 991 students in the sample. The numbers indicate percentages of all courses taken by the sample of graduates for each decade and are ranked on 1983 data.

From Figure 1 it is clear that the curriculum of these Nebraska schools did change from 1953 to 1983. Five domains dominated the curriculum in each decade: English, social sciences, mathematics, business, and natural science. However, in 1953, these domains made up almost 76 percent of the courses taken by the sampled graduates; in 1983 they composed only 64 percent of the courses. Thus, the charge that students are taking fewer rigorous courses is correct for these five domains. On the other hand, the 1953-1983 comparison reveals a substantially broader curriculum in 1983, with increased offerings in home economics, health and physical education, industrial arts, and, to a modest extent, foreign language.

### Three Curriculum Indices

To analyze relationships between the nature of the curriculum and such educational outcomes as grade point averages (GPAs) and results on standardized tests taken by students dur-



Curriculum Domain	1953	1963	1973	1983
English	22.6%	20.4%	19.7%	18.1%
Social Sciences	18.3	16.8	15.1	13.3
Mathematics	11.5	12.8	10.8	11.4
Business	12.3	10.3	10.2	11.3
Natural Science	11.1	12.0	9.9	10.2
Subtotal	(75.8)	(72.3)	(65.7)	(64.3)
Music	7.3	6.9	5.7	6.4
Health/P.E.	2.3	4.8	7.2	6.3
Career Ed/Coop Ed	6.0	4.3	4.4	5.2
Industrial Arts	2.2	3.1	4.7	5.1
Home Economics	2.2	2.5	3.0	3.4
Foreign Language	2.2	3.8	3.9	2.7
Art	0.4	0.7	1.9	2.5
Agriculture	0.8	0.7	0.7	1.8
Safety and Driver Ed	0.3	0.8	2.0	1.4

**Fig. 1. Breakdown of Curriculum Content (1953-1983) Expressed as Percentages of All Courses Taken (N=991)**

ing their senior year, we used three curriculum indices. (No claim is made that these indices constitute the only way of looking at curriculum quality. Other researchers may wish to develop other schemes for representing curriculum rigor.)

The first index, *curriculum breadth*, represents an attempt to assess the variety of courses taken by students. To calculate curriculum breadth, we gave a weight of 1 to each semester course taken. Thus, if a student took an average of five courses per semester for eight semesters, that student's curriculum breadth score would equal 40.

We created a second index, *curriculum depth*, by weighting advanced courses (those having prerequisites) differentially. Thus, regardless of domain, advanced courses received a weight of 2, while those courses without prerequisites were given a weight of 1.

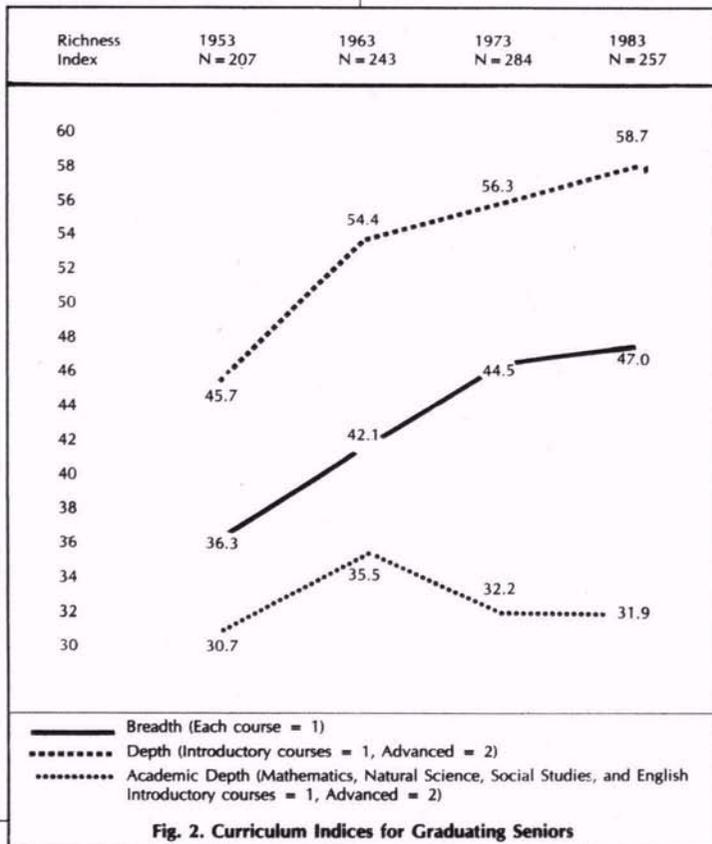
We constructed a third index, *academic curriculum depth*, to give additional weight to advanced courses, each weighted 2, in *only* the four traditional academic areas of English, social studies, mathematics, and science. Foreign language courses were not included, since only a very few students had studied a foreign language. Figure 2 plots the means of the three indices.

It is readily apparent that curriculum breadth increased in each decade. Students took both a broader array of courses and greater numbers of

courses. While the general depth index increased, the bulk of the increase occurred between 1953 and 1963. On

the other hand, academic depth clearly peaked in 1963, declined quite sharply in 1973, and experienced a modest decline from 1973-1983. It appears that the increased breadth that occurred between 1953 and 1963 did not affect the choice of advanced academic courses. However, as breadth continued to increase through 1973 and 1983, it appeared to come at the expense of academic depth.

It was difficult to discover dependable relationships between these indices and standardized test scores since only a relatively small number of transcripts contained achievement test records for tests taken after the first semester of grade 11. No 1953 records contained achievement test scores, and only a small percentage of the transcripts for 1963 and 1973 included American College Test (ACT) scores. For 1983, 124 of 257 transcripts in-



cluded ACT scores. In addition, 57 of 243 transcripts for 1963 and 76 of 284 transcripts for 1973 contained Iowa Tests of Educational Development (ITED) scores taken in the senior year. Thus, because of sample size, we analyzed only the 1983 ACT data and only the 1963 and 1973 ITED data. We found a low positive correlation between academic depth and ACT scores for 1983 as well as low positive correlations between ITED scores and all three indices for 1963 and 1973.

### Grades and Grade Inflation

In designing this study, we listed grade point average (GPA) as an outcome measure. In 14 of the 20 schools sampled, GPAs were higher in 1983 than in any other decade, yet in two schools there was a slight decline in GPA from 1953 to 1983. In more than half the schools, the GPA increased at least one-half a grade over the 30 years. Using the sign test, we determined that grade changes from 1953 to 1983 were significantly different at the .001 level, and that changes between 1963 and 1973 ( $p=0.06$ ) and those between 1973 and 1983 ( $p=.021$ ) were significantly different. Grade changes between 1953 and 1963 and between 1953 and 1973 did not yield significant differences.

Grade inflation was quite marked in the small schools, but GPAs were very stable across the decades in the larger schools. Clearly, GPA is "contaminated" with differential student ability. Thus, one might reasonably hypothesize that more able students not only achieve more highly but also attempt more courses in general as well as more courses that have prerequisites. Since we had no means for controlling for intelligence, the data presented must be interpreted with considerable caution. For every decade and for every breadth and depth index, the correlation with GPA was significant beyond the .01 level. Thus, it appears safe to conclude that a broader and richer curriculum is experienced by students with higher GPAs. The correlations between GPA and the breadth index range from +0.17 to +0.24, while for depth they range from +0.26 to +0.30. Those for the academic depth-GPA relationship ranged from +0.26 to +0.50. Only the

academic depth-GPA correlations consistently increased over the four dates examined in the study.

### Teacher and Patron Perceptions

We also wanted to discover the perceptions of veteran teachers and school patrons with respect to curriculum quality over the time in question. Local school administrators selected teachers who had the longest tenure in the school system and long-time patrons for interviews. Impressions gained in the interviews were later confirmed by data from the questionnaires sent to randomly selected patrons in each community.

We structured the questions around themes of curriculum quality, achievement of students and graduates, school-patron relationships, and school governance. We encountered (perhaps understandably) strongest support for the schools of 1983. Local schools were seen as broadly comprehensive and performing well. While few patrons gave their schools ratings of A+, most were at least moderately pleased with their school's performance. Most believed that the current curriculums were superior to programs of the past, because students now had more courses from which to select. When we asked them to judge the quality of graduates, the same generally positive tone emerged.

On the other hand, their nominations of "eminent" graduates suggested that the standard for eminence was quite local. We deliberately avoided providing examples of or criteria for eminence, preferring to have respondents give us impressions based on their own criteria. This approach yielded some interesting responses. For example, the support many gave us for a positive evaluation of their graduates was the statement that "many go on to the university." Frequent examples of outstanding graduates were successful teachers, nurses, local business persons, attorneys, or physicians. Although it is difficult to regard such nominations as examples of true eminence, such information cannot be ignored. It speaks to a perspective about the local school that has implications for its role in the community and perhaps for the level

of support the community is willing to provide. Further, many policymakers who reach decisions on the basis of mere impressions may find that an interview process can help provide more dependable data.

### Use of the Model

Our study was designed to provide information about schools in a state, but the methodology is readily adaptable to individual districts. We know of no other model for collecting and using the kinds of data described in this study. The information permitted us to draw inferences about changing patterns and perceptions in a sizable number of schools. Yet, since local school units essentially gathered the data, any district could replicate our procedures and, further, do some things that lack of time and funds denied to us. For example, local districts could:

- conduct a follow-up study of their random sample of students to determine relationships between career and civic success and courses studied;
- use local records to analyze course content over time;
- accumulate data banks for making improved curriculum decisions.

Educational researchers could improve upon our model if local schools would keep archival records. Statements of curriculum purpose, course syllabuses and reading lists, samples of teacher-made tests, samples of student works, lesson plans, and similar artifacts, if generally available, would permit a more comprehensive description of the dynamics of curriculum change.

Surely we have reached the time when decision making in our schools can grow out of a sound assessment of the local district—both present and historical conditions—rather than out of the pressure of undocumented local opinion or of experts far from the scene. □

**Erwin H. Goldenstein** is Professor of Curriculum and Instruction and Adult Education. **Royce R. Ronning** is Professor of Educational Psychology, and **L. James Walter** is Associate Professor at the University of Nebraska—Lincoln, Center for Curriculum and Instruction, 118 Henzlik Hall, Lincoln, NE 68588-0355.

Copyright © 1988 by the Association for Supervision and Curriculum Development. All rights reserved.