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Community College/ Cluster Connections

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A distinguishing characteristic of industrial geography the world over is that related businesses tend to cluster. Furniture companies locate near timber reserves, biotech firms near universities or federal labs with strong research programs, and metalworking firms near large original-equipment manufacturers. The close proximity to suppliers, customers, sources of technology, services, and even competitors allows them to transact business more cheaply and easily, achieve a scale that attracts specialized services and resources, resolve problems more quickly and efficiently, and learn sooner and more directly about new technologies and practices.

A vital feature of successful clusters is the presence of a labor force with the skills and knowledge required by the local industries, and an educational system able to train new entrants and upgrade the skills of existing workers. Many community colleges have made economic development their core mission. Specializing in the skills and knowledge needed by local businesses and the regional economy, these colleges have become key regional institutions, not only filling industry's labor requirements but also serving as sources of advice in the modernization of existing industries. The colleges receive equipment and financial support; businesses gain advice and productive employees; and the region's economy benefits from the mobility of the graduates and the flow of information among firms.

To illustrate these developments, four clusters were chosen representing two types of industry concentrations—furniture, a relatively stable, traditional sector, and electronics, a faster growing, technologically advanced industry. The colleges in the clusters are:

- Galway-Mayo Institute of Technology's Furniture College in Letterfrack, Ireland;
- Itawamba Community College in northeast Mississippi;
- De Anza and Mission Community Colleges in California; and
- EUC-Syd, in southern Jutland in Denmark.

Community Colleges and Economic Development

Serving as repositories of information and technology; sources of expertise, advice, and assistance; and nurturers of social capital, technical colleges have special features that give them an advantage in supporting regional development. Perhaps the most important is that, in many places, colleges have assumed some of the responsibility for attracting and expanding industry and have taken on a mission to improve and modernize existing industries. Community colleges are particularly helpful to small and mid-sized enterprises (SMEs), since they are better positioned to reach them than universities, consultants, and service agencies.

The second feature is that the programs and services of technical colleges are intended for local and commuting students and nearby firms. In contrast, flagship research universities, which produce more scientific and technological innovations, are a resource for state or national economic developers.

The third feature is their flexibility compared to other educational institutions. In most states they are the youngest element of the state's educational system and have fewer ingrained traditions and a less rigid organizational structure. This enables them to respond to changes in local labor markets. New programs can be introduced more easily and quickly, and customized to local needs.

Rationale for Connecting Colleges and Clusters

Why would a college choose to make specific industry-based choices in how it allocates its resources rather than take the less risky path of simply preparing its students for a broad range of economic opportunities?

First, it provides an opportunity to create a real-life context for learning that is likely to be relevant to the lives of many students. Second, because students have closer contacts with the workplace, it encourages informal learning and skills that are not easily verbalized or codified. Third, news of job or economic opportunities spreads quickly to students through faculty and social grapevines, and thus labor markets function more effectively. Fourth, colleges that choose

to concentrate resources are more apt to become a true center of excellence with the expertise, knowledge, and technologies that are locally important.

The Colleges and their Systems

Compared to most U. S. systems, both the Danish and Irish community colleges have better articulation with four-year engineering programs, but place less emphasis on noncredit workforce development. The Danish and Irish colleges also serve a younger set of students who are more often full-time than in the U. S. colleges that were studied. Most enter directly from secondary schools. In contrast, U.S. community colleges have stronger workforce-development and continuing education missions, as many U.S. students are adults re-entering the labor force, upgrading skills, or changing careers. That is in part because America's federal job retraining programs, such as the Jobs Training Partnership, fund rather than deliver training, and colleges must compete for funds in order to conduct training. In Europe, separate systems deliver worker and adult training programs directly to adults and school leavers. In addition, in Europe credentials have greater validity and marketability among employers, perhaps because employers are more involved in the design and validation process and in the work-based portion of the curriculum. Therefore, European students are more likely to stay the course and complete their programs, while larger proportions of U.S. students enroll to acquire skills or to explore career options.

Regardless of their different national systems, the four colleges studied have certain common characteristics. In each place, the cluster-based initiatives began as responses to industry—a demand, as in the case of electronics, or a need, as in the case of furniture. Each college focuses on advanced manufacturing processes that are transferable to other sectors but with the content oriented towards the problems and special needs of the local cluster.

The U.S. schools were also influenced by equipment manufacturers who viewed modernization as a way to introduce and build demand for their products. For example, in California, computer and semiconductor manufacturers donated equipment to the colleges. These links to equipment makers greatly expand colleges' access to new technologies, which allows them to position themselves as modernizers within the cluster. Indeed, most of the colleges view themselves as catalysts for modernization rather than as simply responding to needs.

In the U.S., customized training programs have become core elements of college programs, operating alongside credit programs and often funded by non-educational agencies such as those concerned with economic development. The largest companies, which can afford to fill classes and pay costs, typically

dominate programs. Smaller firms, because they usually share classes with other SMEs, accept less customization.

Community colleges in the U.S. play a much more aggressive and proactive role in technology and economic development than the European technical colleges studied. For example, Itawamba's Advanced Furniture Technology Center is equipped mainly by the Gerber Corporation, which installed its latest equipment at the college for free and regularly upgrades it with the understanding that the college will demonstrate it to potential customer-firms and conduct the training necessary for those that use it. In Denmark, where technology diffusion programs have stronger traditions and more support, the college has less responsibility for economic development and relies more on its students as technology transfer agents. Thus, the Danish college acts more as a broker than a consultant, working hand in hand with other agencies that deliver technical services.

Partnerships, Alliances, and Networks

The cluster-focused programs are all characterized by significant employer- and, in the case of Denmark, employee-association involvement. Each of the colleges employs a mix of staff drawn from industry and education and uses local industry advisory boards that meet periodically to review and approve curricula and plans. Each college also arranges for its faculty to work in or consult with industry, which helps them remain up to date and helps industry ensure that the course content is relevant. Directors and key program staff regularly engage with local employers informally through professional and trade association or civic events, or by visiting companies that contract with or employ their students.

College/cluster connections invariably involve strategic alliances with other agencies. Relationships with economic development agencies are the most common, since the quality and quantity of the workforce are fundamental to their success. The U.S. and Irish colleges that were studied have industrial liaison officials who work closely with development offices in planning continuing education and customized training. While U.S. colleges are more likely to deliver technology services that complement education and training directly, the European colleges are more likely to refer to other agencies.

Advantages to the Students

We asked students what drew them to these programs. "Matches interest" was more important to European students (67 and 88 percent in Denmark and Ireland, respectively), than to U.S. students (28 and 6 percent in California and Mississippi, respectively). "Employment opportunity" and "potential to advance"

were important to the U.S. students (63 percent in California and 94 percent in Mississippi).

European students, who generally come directly from compulsory education, are, on average, younger than U.S. students and more likely to look abroad for employment (about one in six). The U.S. students are older, more likely to live in the region, have families and full-time jobs, and therefore seek local employment. The proportion of completers expecting to go on to higher education ranges from one in seven in Denmark to one in four in California.

Job offers at high wages relative to the region and other programs are plentiful in each location, and the close ties between faculty and employers and informal labor market information networks make traditional college placement services superfluous. With education tailored to the work of the industries and students well prepared for the jobs in the industries, employers interviewed expressed high levels of satisfaction with graduates.

At the U.S. sites, a strong economy actually inhibits both enrollment and completion. Labor shortages, particularly in Silicon Valley, lead employers to hire students before they finish. Large companies encourage new hires to continue with their education and even reimburse them for the costs, but many SME employers entice promising students into jobs as soon as they acquire the minimal critical skills needed. Although Europe also has labor shortages, European colleges place a greater emphasis on the final skills certification process, which keeps students in school until they graduate. The main reasons for dropping out of programs at the U.S. sites, where entrants are older, are that students either lack seriousness about their career paths or they get the jobs they want. In Denmark and Ireland, where enrollment is generally a continuation of a youth's educational process, dropping out is often a result of poor academic performance.

In Mississippi, graduates of the programs, with their newly acquired knowledge of inventory methods, computer-based equipment, and costing procedures are able to fill positions formerly held by graduate engineers. However, demand for skilled technicians depends largely on the rate at which industry adopts new technologies. Currently, only the largest companies are adopting new technologies at a high rate. Since graduates' skills and knowledge are transferable to other sectors, they have employment opportunities outside of the cluster. Therefore, if local companies fail to create opportunities, the cluster may lose some of its best and brightest technicians and future owners.

In Ireland, the students' strength is their knowledge of design and modern management techniques, but few firms are ready for their talents.

This leaves the students with three choices: (1) leave Ireland to work, (2) convince a company to accept their help in modernizing (supported by the new technology center at Letterfrack), or (3) start their own company. Fifteen graduates have already taken the third option and started companies—a few quite successfully.

In California's electronics cluster, students operate in a seller's market for skills, as employers compete and recruit from each other to obtain qualified and experienced workers. Most students in electronics or computer systems programs have a wide choice of jobs. Employers are challenged to retain their workforce in a cluster characterized by highly fluid labor markets, job mobility, and little tradition of firm loyalty.

Danish students are valued because of the abilities and experience they acquire during their 20-week workplace education terms. However, they are wary of the cluster's future, in part because of its dependency on one large employer. Demand still outpaces current supply, but students are watching the market carefully.

Advantages to the Clusters

At colleges linked to clusters, faculty relationships to businesses help ensure that curricula are relevant and that new workforce entrants will be well prepared. Second, community colleges are major sources of management training and technical assistance for smaller companies that are less able to afford consultants. Third, colleges contribute to the region's social infrastructure through continuing education, industry seminars, and other events that provide safe havens in which businesses can get to know each other, build trust, and learn from one another. Fourth, colleges are storehouses and disseminators of information about technologies, benchmark practices, market opportunities, and technical advisors for the clusters, particularly for SMEs that have limited internal capacity. Fifth, well-prepared students can become catalysts for change within an industry—if given the opportunity by their employers. This is particularly true in the more traditional furniture industry.

Advantages to the Regional Economies

The impacts of cluster/college connections on their respective regions take three forms. First and foremost, the colleges contribute to the synergy of the economy. Because of the mobility of their graduates, and their contributions to the flow of information among firms, the impact of the college on the regional economy is greater than the sum of its individual impacts on its customers. Second, the school is a major local employer, source of revenue,

and community and cultural center. The smaller the community, the more visible the institution and the more important its contribution to the economy. Third, the presence of the college is marketed in industrial recruitment and is often an important consideration for businesses choosing among alternative locations. Colleges are particularly important to businesses that match those within the cluster and therefore can benefit from the expertise of the college.

Summary of Strengths and Weaknesses

While each of the college/cluster connections studied has achieved measurable successes and impacts, each has its own particular strengths and weaknesses from the perspectives of both the companies and the students. These strengths and weaknesses are not all under the control of the program managers; many reflect external market conditions, state policy, and resources.

EUC-Syd's strengths, for example, are the quality of its technical school and workplace-based programs targeted to the cluster, the cluster-based experience of the staff, and its connections to industry. The weaknesses are a function of the academic segmentation within the system itself and demographic factors. Galway-Mayo Institute of Technology's highly regarded furniture program has, in a short time, built strong community and government support. Its potential shortcomings are related to the weaknesses in the cluster itself and the remoteness of its location. California's programs have scale, industry resources, and support, but lack good connections to SMEs, despite the efforts of its technology centers to reach out to them. Itawamba Community College has the leading advanced technology center for this industry in the U.S., has established good relationships with industry, and is considered a major draw by economic developers; but it has not adequately marketed itself to young people and has not yet reached the smaller firms.

Policies to Encourage Community College/Cluster Connections

It is important to emphasize that the specialization linked to the industry clusters we studied occurred within the context of a very broad set of programs in strong colleges. Colleges still serve a wide range of individual and industry needs. But for a defined set of industries, targeting allows a college to develop special strengths above and beyond what other programs at the college can offer.

Since the core funding of most community colleges is tied to full-time equivalent enrollments that reflect student choices, not local needs, a college may not be able to reach the necessary critical mass to develop or acquire the expertise and technology needed by a set of regional industries. Students may

not be making choices for careers that are regionally based, and industries may not have sufficient demand to justify special programs—particularly in less populated areas. Another barrier to specialization is support for the aims of liberal education, and the belief that this is undermined when unduly influenced by private interests.

What can college governing systems do to create alternative funding sources for programs that strengthen economies? To begin, the state system can analyze its regional economies and examine existing strengths of the colleges to determine which clusters could benefit from special attention, what types of skills they will require, and which colleges might best serve those industries. Alternatively, they can ask each college, as part of its regular planning process, to analyze its own regional economy and determine whether specialization is warranted.

The system can offer incentives to colleges for establishing semi-autonomous centers and for employing faculty from industry, and it can reward faculty for relationships with industry and consulting as well as teaching. The state can make it easier to justify new programs—allowing more flexibility in enrollment levels and completion rates—that take into account the dynamic nature or strategic importance of the cluster. It can also allow greater flexibility in faculty requirements and compensation in order to attract staff with experience.

The state system might provide greater support for programs that demonstrate industry involvement, interest, and matching resources. Developing cluster connections requires public and private resources as well as close relationships with industry, and college administrators ought to be encouraged and rewarded for building such linkages.

Finally, colleges can work more closely with high schools to attract students into the programs by helping to acquaint them with the industries as they operate today and not as they have in the past. This will give students a better appreciation of the range of opportunities industries offer and help them to understand the different kinds of skills they would use. ❁

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