



News

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From the President



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NCHEMS President

Much of the work that we do at NCHEMS is at the interface between institutions of higher education and their various constituencies. The policy work in which we are so deeply engaged makes us keenly aware of the evolving relationships between state governments and the colleges and universities within their borders. Our many needs assessment projects help to ensure that we understand the perspective of employers. Our program evaluation and assessment activities give us insights into the differing expectations of the various student bodies served by institutions of higher education. This array of activities gives our staff a unique window on the increasingly complex and multifaceted world within which institutions must function.

In the midst of all the diversity of specific expectations registered by the various clients, one theme is consistent—reflected in one word that we hear more often than any other. That word is **responsiveness**. We hear it more often than “price” (or cost). We certainly hear it more often than “quality,” especially as those of us attached to the academy typically define that term. But while many colleges and universities have taken steps intended to increase their responsiveness to the

clients they serve, it is disconcerting to see how often these attempts misfire and how much louder the demands for increased responsiveness have become over the past few years.

Boiled down to its essence, responsiveness is judged in terms of an institution’s ability to:

- Provide the educational services clients have determined they need.
- Do so in accordance with terms and conditions the clients find acceptable.

Our experience is that client demands are diverging from traditional institutional norms along both of these dimensions and many colleges and universities are struggling to adapt. Students are seeking certifications that have currency in the marketplace. They aren’t necessarily denying the importance of a degree, but they increasingly want some **additional** documentation of the competencies they have acquired as well as of courses they have completed. In addition, many students express more basic demands: give us access to the programs we want, the courses that you require us to take and the key resources that you have assembled (especially faculty and state-of-the-art technology).

The needs of employers tend to be much more specific. In a first conversation, they will usually express needs in terms of the kinds of knowledge and skills that will allow individuals to “hit the ground running” in their organizations. When pressed, however, they express these needs as technical or disciplinary competencies augmented by a set of very specific basic and higher order skills that most institutions would argue they are already delivering. On paper, at least, what employers are asking and what institutions are providing would seem to be in congruence. So what’s the problem? The issue is explored in considerably more detail in the major article inside this newsletter.

It is in regard to the “terms and conditions that clients find acceptable” that institutions are working hardest to adapt. Clients are seeking relief from the barriers of time and place. They are much less willing (and often unable) to accommodate either academic calendars or the necessity of making the trek to campus to obtain needed services. Responsiveness in this domain is leading institutions into greater dependency on technology. Use of technology is rapidly moving beyond experimentation and demonstration projects and into the mainstream. With this greater use comes a series of managerial questions that are now front and center on the radar screens of institutional administrators. These include questions like:

- What are the comparative costs of alternative forms of instruction?
- Under what conditions can alternative forms of delivery be made cost-effective?
- How do we have to change the way we do business in order to be able to afford responsiveness?

We don’t have answers to all these questions, but we’re working on them. In collaboration with the Western Cooperative for Educational Telecommunications, we’re developing a manual of procedures for calculating the costs of alternative modes of delivery. This manual is scheduled to be available in late summer. We’re also engaged in a series of other activities related to technology, its costs and effective use. This topic will be the subject of the next newsletter.

As a final note, I want to take this public opportunity to welcome John Clark to the NCHEMS staff. John is a rarity—he grew up and was educated in Colorado. He brings his considerable analytic and statistical skills to the aid of those of us who rely heavily on the use of data in our project work. In a few short weeks he’s proven his worth. We’re very glad he’s a member of the NCHEMS family.

Knowledge and Skills Needed to Succeed in the 21st Century Workplace

Introduction

A significant part of NCHEMS' work includes helping colleges and universities become more responsive to local and regional employment needs. Part of this entails talking to employers about their expectations of what new employees need to know and be able to do. Because workforce preparation is such a hot topic at the moment, we felt it appropriate to share the information we have acquired about the types of knowledge and skills employers will be looking for in their future employees—who just happen to be our graduates.

Where will growth happen?

To begin this discussion it is helpful to look at which industries and occupations are expected to experience the greatest growth. Data from the Bureau of Labor Statistics show that the service industry will account for nearly 85 percent of the projected growth in all wage and salary jobs through 2006. Most of these jobs will be in business and health services. Within business, the greatest growth is predicted in computer and data processing services followed by miscellaneous business services such as credit reporting agencies, mailing and commercial art, and guard and security services. Within the health services industry, employees will be needed in medical and dental offices, at nursing and personal care facilities, in home health care services, and in medical and dental labs.

Three occupational groups expected to grow the fastest will be those categorized as professional specialty, technicians, and related support and service. Professional specialty and service occupations will account for almost half of the overall occupational growth rate between 1996 and 2006. These professions include teachers, librarians, counselors, computer programmers and systems analysts, mathematicians, and research personnel, as well as those in health assessment and treatment occupations.

It is also useful to examine occupational growth rates by the amount of education required. Projected growth rate in occupations between 1996 and 2006 indicate that many jobs will require some formal education beyond high school. For example, eighteen of the Department of Labor's twenty-five occupations with the greatest expected percentage growth rates (as well as high pay and low unemployment rates) require at least a bachelor's degree. And the twenty highest paying occupations require a bachelor's degree. Obviously, many of the fastest growing occupations will require some amount of postsecondary education and/or training.

What types of skills will "21st Century" employees need?

When NCHEMS is approached by colleges and universities (as well as systems and states) to help them become more responsive to the needs of their communities and local employers, we begin first by conducting an "environmental scan" followed by interviews with specific employers. The environmental scan consists of analyzing U.S. Census and Labor Department data for trends in the industries providing the jobs and the occupations of the residents of the region. This is typically buttressed by education and additional economic data in order to understand the academic, economic, and labor resources available to area employers as well as educators. Then, in conjunction with the college administration, NCHEMS identifies important area employers in both the private and public sectors. NCHEMS staff then interview employers, typically personnel directors and CEOs, to understand the skills and knowledge needed by their employees to function effectively in the workplace. Many blue ribbon panels have identified the skills that are necessary for success in today's economy and occupations. But employers often focus on attitudes and dispositions as a key element overlooked in discussions about knowledge and skills.

NCHEMS has interviewed thousands of employers in nearly half of the states. The interviewees have

represented a range of industries and occupations from cotton farmers to tire manufacturers to biotech research and development firms. A synthesis of research in this area as well as our experience in the field identify the following categories of knowledge, skills, and attitudes necessary for success in the 21st Century workforce:

1. Attitudes and personal characteristics (e.g., adaptability, reliability, etc.)
2. Essential skills for entry level employment (e.g., computer skills, reading, etc.)
3. Integrative-applied skills, which are “essential skills” applied in more complex situations (e.g., critical thinking, presentation skills, etc.)
4. Premium skills, which are not mandatory, but are important additions to “essential” and “integrative-applied” skills (e.g., ethics, “multicultural” competence skills, etc.)

(See Table 1 for a list of the skills in each category.)

At the most fundamental level, we find employers needing employees with basic workplace skills—being able to read simple documents, knowing how to present oneself in an interview, and having a good work ethic (such as showing up on time and completing tasks). Complaints about the absence of such skills come not just from employers who hire individuals with a high school diploma or less, but also from employers looking for people with bachelor’s degrees and higher.

At the next level, essential skills, many employers lament their employees’ inability to communicate orally and in writing, which prevents them from being able to interact effectively with fellow employees and customers. A related concern at this level involves “people skills”—that is, the ability to work in teams, manage others, resolve interpersonal conflict, and respond to customer complaints. Human resource personnel at several large hospitals in one area recounted the difficulty in finding nursing personnel who are capable of working effectively with their coworkers and who are responsive to patient needs and concerns.

The next level, integrative-applied skills, is best illustrated by an example drawn from one of our interviews. A large telecommunications company executive described needing employees capable of working in teams with fluid membership, at times taking leadership positions and at other times serving in a support role, understanding and assessing the customer’s problem, devising alternate solutions with fellow team members, and communicating these effectively to the customer.

The last level of skills required by employers involves employees’ ability to work with and understand the

organizational context within which they work (such as legal and environmental issues), be knowledgeable of and comfortable with different cultures, and to manage themselves and others in complicated, changing projects. For example, in one region where NCHEMS worked, the primary economy involved producing, processing, and distributing agricultural products. Additionally, the demography of the area was changing very rapidly with a large influx of (largely economically and academically disadvantaged) immigrants from different countries. Area employers needed business managers who were not only skilled in the specifics of agricultural production and distribution, but comfortable in more than one language and conversant in different cultures as well.

Clearly, a gap exists between what many undergraduates learn in college and the knowledge and skills necessary for today’s workforce. Take the most frequently-heard examples cited above: employers tell us that many recent graduates cannot communicate effectively (in writing or orally), cannot solve real world “messy” problems, and have difficulty working in teams. What does this mean for postsecondary education curricula? First, students need to write more. Second, in addition to learning how to parse perfect sentences, students need to learn how to write in different contexts. That is, they need to be able to write memos for their boss as well as their colleagues—often under tight time constraints in which they cannot re-read and revise their work. Third, students need exposure to and experience with not only solving, but identifying real world messy problems that defy neat definitions. For example, we find that many employers are quite satisfied with recent college graduates’ abilities to solve problems; it is finding the right problem to solve that stumps many graduates.

Employers consistently ask for educational experiences that will help students understand the world in which they will have to apply what they learn in college. These requirements can be met in many ways. One way is through workplace-based cooperative education or internship experiences for students. Alternatively, faculty can do the internships in order to understand what is needed in today’s workplace and incorporate what they have learned into their curricula. A third approach is to involve employers in assessing student projects. The “outside” view employers bring enriches what students, as well as faculty, learn in this process. Probably the most straightforward means of accomplishing this is to have employers participate in deciding what learning outcomes students should take away from different programs. This is often done with community college occupational programs through employer advisory councils, but is rarely done in other, more academic curricula (or four-year institutions for that matter).

Table 1

A synthesis of the research in this area by NCHEMS shows that the following knowledge, skills, and attitudes are necessary for success in the 21st Century workforce.

Attitudes and Personal Characteristics

1. Adaptability/flexibility/resiliency/ability to accept ambiguity
2. Common sense and ability to anticipate consequences
3. Creativity
4. Empathy
5. Positive attitude/good work ethic/ability to self manage
6. Reliability and dependability
7. Responsibility/honesty/integrity

Essential Skills

Necessary for entry level employment

1. Computer skills for simple tasks (word processing)
2. Interpersonal skills/team skills
3. Numeracy and computation skills at a ninth-grade level
4. Reading at a ninth-grade level
5. Speaking and listening
6. Writing

Integrative-Applied Skills

“Essential skills” applied in more complex situations

1. Application of technology to tasks
2. Critical thinking
3. Customer contact skills
4. Information use skills
5. Presentation skills
6. Problem-recognition/definition/solution formulation
7. Reasoning

Premium Skills

Not mandatory but important additions to “essential” and “integrative-applied” skills

1. Ability to understand organizational and contextual issues (legal, environmental)
2. Basic resource management, budgets
3. Ethics
4. Foreign language fluency
5. Globalism, international skills (understanding international systems and their implications for business)
6. “Multicultural” competence skills (a familiarity with how different nations operate and interact as well as an openness to new cultures)
7. Negotiation skills
8. Project management and supervision
9. Systems thinking

Another implication for college curricula is the need for interdisciplinary degrees and/or training. One of the employers NCHEMS interviewed indicated an industry-wide need for a Masters level program in bioinformatics—a blending of database management and graphics that requires preparation in both molecular biology and information technology. Such an interdisciplinary program was a natural for the university NCHEMS was working with because of its strong biology and computer science departments. But it required the existence of structure, such as a continuing education department whose primary function is outreach to local and regional employers. Such a department has to be staffed by industry specialists or coordinators who understand the industry with which they are dealing and can interpret industry needs to content providers. It also required mechanisms that did not exist at the time to act as internal incentives for faculty to create such content.

Finally, in an increasingly information-based economy, skills and knowledge are constantly changing. Colleges and universities must be prepared to launch degree or certificate programs that can be deployed quickly, that are flexible, and that do not create free-standing structures which will need to be dismantled once the need is served. Another set of employers who NCHEMS worked with needed graduate level degrees in human resources for a limited number of employees. This required that the local institution provide a human resources program on a cohort-basis. That is, the institution set up such a program for a single group of students/employees who went through the program together. Once the cohort graduated, there was no longer a need for the program and it was discontinued. Clearly, the ability to address employer need necessitates creative and flexible programming and staffing by colleges and universities.

“The Bottom Line”

Labor data on occupations and industries, coupled with our employer interviews, suggest that not only will some type of formal postsecondary education be necessary in many of the fastest growing occupations, but that many college graduates enter the workforce without the kinds of skills and knowledge employers value the most. Changes in college pedagogy and increased contact and interaction with employers would go a long way toward closing the gaps we see between undergraduates’ knowledge and skills and 21st Century workforce needs.

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