CHAPTER 3

# EMPLOYER EXPECTATIONS OF INFORMATION LITERACY: IDENTIFYING THE SKILLS GAP

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The 21st century finds renewed discussion of the importance of a liberal arts education. Citing the demands of a "complex and volatile" global economy, the Association of American Colleges and Universities (AACU) presented the case in terms of "essential learning outcomes," including information literacy (IL), that cross all areas of study (National Leadership Council for Liberal Education and America's Promise, 2007, p. 12). A survey of business executives conducted by the American Management Association (2010) names the crucial skills, "critical thinking, creativity, collaboration, and communication skills" (p. 2), and acknowledges four-year colleges as the educational institutions most likely to develop a proficient workforce. Employers surveyed by the AACU (Hart Research Associates, 2013) overwhelmingly felt these capacities to be more important than a candidate's undergraduate major (p. 1).

Unfortunately, the resurging interest in these broad language, thinking, and interpersonal skills is largely driven by a sense that universities are not adequately preparing the nation's students. Even in an economy beset by persistently high unemployment, employers complain that jobs cannot be filled because applicants lack these critical "soft skills" (American Society for Training and Development, 2012, p. 7). They also report that recent college graduates rarely demonstrate expected and needed research competencies (Head, 2012). The persistent concern for graduates' career readiness suggests that traditional liberal arts education is not meeting the needs of the 21st century's information economy.

Within liberal arts universities, library faculty have been among the first to address the issue, perhaps because they were first impacted by the same technologies that have so dramatically altered the global business environment. Over the past thirty years, academic librarians have expanded their role as information curators to embrace research and instruction within a broader notion of "information skills" (Rader, 2002) or IL (Pinto, Cordón & Díaz, 2010). By 1987, the American Library Association (ALA) had appointed a committee to

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study the role of IL in business, government, and education (American Library Association, 1989).

Two years later, Patricia S. Breivik and E. Gordon Gee (1989) called for an IL revolution, pointing to academic libraries as the "key to achieving higher education reform goals" (p. 3) necessitated by the exploding information age, along with public librarians who would be instrumental in locating and organizing their communities' economic development data. The resulting IL would help workers engage in *lifelong learning* and allow them to become the flexible, easily trainable workforce that business leaders were calling for. Subsequent work showed a "vital link between higher education, information literacy and lifelong learning" (Head, Van Hoeck, Eschler & Fullerton, 2013, p. 75) with some researchers focusing on the need to "guarantee a competitive workforce in times of turbulent global change" and others on the desire to promote "personal growth and social equality and enrich society" through learning (p. 6).

Agreement that IL is important in the workplace has not offered, however, much guidance to universities seeking to prepare their students for professional success. Over the past two decades, efforts to better integrate IL into business curricula have resulted in limited change. There has been no "collective impact on business curricula in general," and business, trade and professional leaders continue to describe IL with a vocabulary of desirable but generic soft skills (Sokoloff, 2012). The lack of curricular and business attention to IL has been attributed to accreditation pressure to focus on more easily measurable outcomes (Sokoloff, 2012), an overemphasis on technology issues (Association of College and Research Libraries, 1998), differences in terminology (Conley & Gil, 2011; Klusek & Bornstein, 2006; Leveson, 2000; O'Sullivan, 2002), and the overwhelming nature of the task (Fiegen, Cherry & Watson, 2002).

Qualitative research (Head et al., 2013) suggests the mismatch between academic preparation and employer expectations is not a simple matter of incommensurate vocabularies, or even the more embarrassing but equally simple problem of inadequate education. As a concept, IL grew from roots in bibliographic instruction, but the contemporary domain encompasses functional, critical, and rhetorical "multiliteracies" that extend across multiple purposes, technologies, and disciplines (Selber, 2004). The specific issues of differing priorities, knowledge bases, and vocabularies have been clearly shown to be factors in the academic/employer mismatch, but more fundamental issues involve the use of information in a specific professional context. Extensive interviews conducted across a wide variety of professional settings have revealed consistent challenges (Head et al., 2013); college graduates are not well prepared for the social nature of information storage, the ambiguities inherent in the search for information, or the rigors of timely thoroughness.

Recognizing these challenges, the *Framework for Information Literacy for Higher Education* (ACRL, 2015) marks a significant broadening from functionally defined IL skills toward an appreciation for the context in which information will be used and a capacity for contextualized interpretation of information that leads to reasonable conclusions. The domain of IL still encompasses the functional literacy of where and how to get information as well as the critical literacy of assessing the nature and use of information, but it is the rhetorical literacy of constructing meaning from contextualized data that seems to matter most in the workplace.

## ONE UNIVERSITY'S RESPONSE

The University of Northern Iowa's College of Business Administration helps students develop their soft skills with a program designed to introduce all business majors to the broad er thinking, communication, and interpersonal skills associated with professional success. Begun in 2010, the College's Professional Readiness Program (Hillyer, 2013) relies on an advisory board of business faculty, a network of alumni and corporate partners, and a staff of faculty and graduate assistants from the liberal arts disciplines to create programming and resources that support students' professional development efforts across their entire college experience.

Relying on published survey research with Fortune 500 companies, the program addresses 37 skill sets in the areas of professional attitude, communication and presentation skills, writing and reasoning skills, and organizational awareness. Business research is classified as a writing and reasoning skill, along with business documents, problem solving, clear descriptions, audience analysis, critical thinking, persuasive arguments, and message construction (Cyphert, 2011). New business majors attend a series of mandatory meetings while they are taking their liberal arts courses, followed by activities and resources designed to integrate professional context and expectations into the major courses over the junior and senior years. At both levels, professionals serve as speakers and meeting facilitators, solidifying the students' ability to apply the skills during interviews, internships, and ultimately in their business careers.

Business research skills are one area of professional readiness, so a faculty member and the library's business specialist began a project to develop professionally relevant resources for the program. It became apparent that neither the general academic research skills that were part of the liberal arts curriculum, nor the business-specific research tools that had been created to support the academic curriculum were targeting workplace research priorities as described by professionals. A project was undertaken to systematically define the career-relevant skill sets, determine the skills gap that existed for business majors taking

professional positions in the region, and develop program resources to prepare them more appropriately.

The skill set that emerged encompassed broad notions of IL, unsurprising based on the previous work that had been done regarding workplace readiness. A subsequent survey of employers identified a somewhat more surprising pattern of relatively small gaps between the skills desired by employers and those held by college-educated entry-level employees, suggesting that a collaborative process to define workplace skills from a professional perspective might resolve some of the terminology problems. On the other hand, the project also demonstrates the degree to which ongoing collaboration will be necessary to provide instruction that prepares students for a socially and rhetorically complex workplace environment.

## DEFINING THE SKILL SET

The project began with a straightforward request within a professional network of business librarians. In retrospect, the assumptions inherent in that request for advice are illustrative. We asked about employer expectations regarding databases, research reports, key trade journals, and automated information sources. Our own focus on students' ability to use specific information sources belies a *functional* orientation that we ultimately found to be out of sync with the professional community's more *rhetorical* understanding of the skill set. A review of the research on IL in business contexts illustrates the degree to which IL differs in work and educational settings (Weiner, 2011) as well as the degree to which employers describe a wide range of intellectual, technical, and social behavior as just a few key categories of worker preparation. More recent studies, such as the Project Information Literacy Research Report on recent college graduates, also have found a "distinct difference between the information competencies and strategies today's graduates bring with them to the workplace and the broader skill set that more seasoned employers need and expect" (Head, 2012, p. 24).

## RESEARCH ON INFORMATION LITERACY IN THE BUSINESS PROFESSIONS

In 1989, the American Library Association (ALA) committee's final report warned that "a lack of timely and accurate information is costly to American businesses" (American Library Association, 1989, para. 8) and promised that "those who learn how to achieve access to the bath of knowledge that already envelops the world will be the future's aristocrats of achievement" (para. 12). Noting the role of libraries "as the potentially strongest and most far-reaching

community resource for lifelong learning" (para. 19) as well as the dearth of attention in the business discussion of the emerging information society, the ALA called for efforts to raise awareness of the importance of IL.

A review of the research conducted over the following decade found that businesses were focused on the pragmatic issues of technology adoption, leaving the exploration of the uses of information to the academics (Bruce, 1999; 2000). Theoretical and educational models of IL thus continued to develop, but they were based primarily on data collected in academic settings and analyzed by professional librarians. Over the same decade, a few business faculty began to explore the importance of research skills and IL in a contemporary business environment (for example Ali & Katz, 2010; Burke, Katz, Handy & Polimeni, 2008; Hawes, 1994; Karakaya & Karakaya, 1996; Katz, Haras & Blaszczynski, 2010; Schlee & Harich, 2010; Walker et al., 2009), leading to expanded research on workplace information use.

The most obvious feature of this initial research is the broadened scope of knowledge, skills, and attitudes involved in professional contexts. Acknowledging that "libraries and dedicated librarians have taken the lead," one organizational development consultant deemed it "not enough" in a business environment where "information comes from many sources and can be obtained in many ways" (Goad, 2002, p. x). Abigail J. Sellen, Rachel Murphy, and Kate L. Shaw (2002) used diaries of knowledge workers to categorize the complex information tasks involved in their use of the Internet, which included steps to maintain and monitor the business environment as well as seek, evaluate, and retain specific information. Similarly, O'Sullivan (2002) pointed out that workers "are faced with information overload, have difficulty finding what they need quickly and efficiently, and are struggling with issues of quality and credibility" (p. 9).

The solution seemed to be an expansion of the concept of IL to encompass the "peripheral" skills that allow a worker to "do the steps" involved in accessing, evaluating, and using information (Goad, 2002, p. 30). Soft skills of time management, business outlook, delegation, and teamwork (O'Sullivan, 2002) as well as communication, critical thinking, risk-taking, computer literacy, and business literacy (Goad, 2002, p. x) were proposed as essential. O'Sullivan concluded that it is possible to "massage" the concepts of learning organizations, knowledge management, and lifelong learning so that they encompass the terminology of IL, but "this approach only skirts around the edges" of IL as a "holistic concept" (p.11).

O'Sullivan (2002) proposed a framework to reconcile business and academic perspective as an issue of organizational level, suggesting that

> businesses have been concentrating on implementing knowledge strategies and have not yet got past the infrastructure

> and management buy-in hurdles to the question of individual capability and contribution. When they do start to look at how individuals are coping with life in a knowledge company, and at the employee's ability to contribute positively, the information literacy gap will be self-evident. (p. 11)

Within an organizational context, however, individuals' goals, capacities, and procedural choices do not lead to organizational outcomes in an additive way. The success of a *learning organization* depends on tapping its complex internal interrelationships to foster long-term collective success (Senge, 1994), and *knowledge management* is distinguished by the opacity of the underlying tasks (Drucker, 1973). Peter F. Drucker later referred to the need to be "information literate" in today's organization (Harris, 1993, p. 120), but any link between individual skill development and enterprise-level outcomes is necessarily complicated by the economic and political environment of the business, the contextual complexity of work, and the systems nature of organizations.

**Economic and political environment.** The initial formulation of IL was itself a function of a changing workplace where technology was shifting labor from routine manual and cognitive tasks toward more sophisticated behaviors (Autor, Levy & Murnane, 2003). During the 1980s, U.S. business leaders had recognized that global competitiveness would increasingly rely on a flexible, quality-minded workforce and became concerned about worker readiness (Johnston & Packer, 1987). Anthony Carnevale's (1991) influential report described the shift as one from "job-specific to more general capabilities" and "personal skills" that could be applied across a variety of "fluid contexts" (p. 101). In the new technologically enhanced workplace, the "collecting, recording, analyzing, and communicating of information" was just one more "labor-intensive" task that was being "subsumed in information-based or communications technology" (p. 102).

Although the vocabulary of *lifelong learning* seemed to reflect the academic learning that libraries traditionally supported, organizational goals were quite different. The concern was not for workers to become better at information processing tasks; computers were expected to take over those functions. Instead, workers previously educated to do those jobs would be required to gain the "self-management and interpersonal skills" needed for the increasing levels of social interaction the new workplace required (p. 103).

Similarly, business' call for more *empowered* workers was not a simple corollary to educators' notion of learners with information-gathering skills that would allow them to learn on their own. Cost savings from an increased use of technology could be amplified with a decrease in organizational levels. As

production workers gained communication, teamwork, and problem-solving skills, they would be able to take on the autonomous, decision-making required in a lean organization—one that aimed to replace multiple layers of expensive management with computers and empowered workers.

**Complexity of information work.** The last decade has seen a shift toward more fine-grained attempts to identify the discrete information skills needed in business contexts, fleshing out the relationship between traditional library-based definitions of IL and the business community's concern for more broadly defined communication and critical thinking attributes. The results highlight differences in vocabulary and conceptualization of the tasks, but illustrate as well the complexity of workplace information use.

In one attempt to prove the importance of IL in the business environment (Klusek & Bornstein, 2006), elements of IL were mapped to the U.S. Department of Labor's O*Net job categories. Louise Klusek and Jerry Bornstein (2006) observed that those outside academe do not recognize that IL is neither library-centered nor information technology-centered, and they concluded that while the "business community has not embraced the concept of information literacy, IL skills are in fact highly valued in the field" (p. 19). However, their analysis does not fully account for differences in the perceived sophistication of various skills. To some extent, academics and professionals simply reverse the skill hierarchy. The O*Net descriptions place explicit search and manipulation of information within larger categories of *Complex Problem Solving* and *Critical Thinking and Instructing*, while the librarian authors argue that, "critical thinking and communication are core concepts of information literacy" (p. 5). Conversely, employers classify many IL skills as basic work readiness and learning skills (e.g. reading comprehension, listening), rather than sophisticated knowledge processing skills that might be expected of college graduates.

In Carnevale's precursor to the O*Net database development, key components of "learning to learn" were "the cognitive domain of skills we use to collect, know, and comprehend information" (1991, p. 111), understood as foundational to gaining the more sophisticated skills needed in the New Economy and included in the O*Net catalog of basic skills (Askov, 1996). Carnevale's competency description was not focused on the manipulation of complex information, but on leveraging individual learning styles and using learning strategies and tools to effectively apply new knowledge to new job requirements. Conversely, Carnevale's description of problem solving skills focused on the use of various business-specific problem-solving methods (i.e., Juran and Friedman & Yarborough Comprehensive Models, as well as more general Dewey-based processes). Beyond a first step to "recognize, define, and analyze problems" (1991, p. 115), there is no overlap with the accepted elements of IL.

An ability to use popular management tools is thought to prepare a newly empowered worker for broader responsibilities, but the fundamental abilities to think logically, critically, and systematically are seemingly subsumed in the very basic elements of worker readiness to learn. In short, differences in vocabulary and priority seem to involve implicit assumptions about the relative teachability of cognitive skills. Academic librarians understand problem-solving skills to be learned steps in the development of IL, while the business community seems to perceive them as a general capacity to learn a variety of relevant, technical skills such as computer use, managerial methods, and communication processes.

Theresa M. Conley and Esther L. Gil (2011) parse this dichotomy further in a recent employer survey. Employers agree on the importance of the skill set, but when challenged to provide a more business-oriented term for "information literacy," their top two choices were "critical thinking" and "decision-making." Meanwhile, the most traditional aspect of IL, the location and retrieval of information from a wide variety of sources, was deemed the easiest part of the process. The important and more difficult skills were the abilities to recognize the need for information and to use it effectively.

Jason Sokoloff (2012), after surveying employers, concluded, "non-librarians have little awareness of information literacy and instead conflate technology and communication skills as essential qualifications for mastering information and managing knowledge in the work place" (p. 6). In the work context, information use is not understood as a cognitive ability, but as a set of relatively complicated technical tasks to be accomplished. Information technology consultant Craig Roth (2011), for instance, describes the contemporary information worker's job as an "active, conscious effort at subscribing to the right sources, setting filters, creating watch lists, setting bookmarks, tagging, friending, and developing the right social networks to get and analyze information" (para. 5). Roth warns against an "old-fashioned" assumption that the knowledge worker's only "'real' job is to define problems, analyze the information, find alternatives, etc." (para. 4) using information easily at hand. At the same time, his description of workplace information gathering emphasizes the contextual and cultural experience of a worker whose "intuition about what is of value, and applying years of accumulated knowledge about where to look and (more importantly) who to pay attention to is of tremendous value in a knowledge economy" (para. 7).

**Organizational systems.** IL has been primarily concerned with the personal development of an individual information seeker or learner, especially with respect to text-based information resources (Ferguson, 2009). The skills are typically defined within a predominant paradigm of computing and telecommunications

that understands information processing as a staged progression from "noise (unorganized data) to perceived data, to (organized) information, to knowledge" (Marcum, 2002, p. 3). The result is a linear model; independent assembly and use of objective information is the ultimate goal. In contrast, the functional role of any individual within a large, complex organization is neither linear nor independent, and information is only occasionally objective. Instead, contemporary business organizations are better understood from a complex systems perspective (Axelrod & Cohen, 1999; Gharajedaghi, 1999). Organizational activities are not simple collections of acts performed by discrete individuals, each carrying an individual set of skills, but collectively constituted patterns of interaction, affordance, and social interpretation (Taylor & Van Every, 2000; Wilson, Goodman & Cronin, 2007).

Professionals seem to intuitively recognize that social skills make it possible for individuals to negotiate the complex "knowledge ecosystem" of "people, processes, technology and content" (Standards Australia, 2005, p. 8), and workplace research has begun to demonstrate the limitations of the individual-based model of IL in a contemporary organization. A survey of corporate librarians and information professionals (Matesic, 2005), for example, found that IL was understood as the special domain of the company library, while non-specialists were seen as needing communication and context knowledge to effectively utilize the library staff's information resources. Similarly, Sokolof (2012) found that new employees were not expected to engage in information tasks alone, but instead to assist and rely on senior colleagues who had developed the company and industry experience needed for effectively accessing and evaluating information.

Christine Bruce (2011) has noted that two key lines of research have emerged that contradict the "traditional skills and competency approach" (p. 335). One is her own "phenomenographic" framework; the other is Annemaree Lloyd's sociocultural research (2006; 2011). This literature illustrates the degree to which IL does not exist separately from an organizational environment, and "its many dimensions are closely related to the contexts in which it is experienced" (Bruce, 2011, p. 335). The takeaway is a distinction between *information experience*, which is the collective, context-bound, and socially constructed environment within which a set of embodied *information behaviors* utilize individual knowledge, skills, and attributes. There is no simple translation of individual IL skills to the collective, distributed negotiation of knowledge as it occurs at an organizational level. The recently developed *Framework for IL* (2015) recognizes this complexity by presenting flexible core concepts, such as the constructed and contextual nature of authority, rather than a prescriptive set of decontextualized skills.

## EMPLOYER EXPECTATIONS AND EMPLOYEE SKILLS

Research thus shows that any transition from academic preparation to workplace application involves considerably more than a simple transfer of objective, individual skills to a new context, and pedagogical success will require more than simply translating IL vocabulary from library to workplace contexts or acknowledging differing priorities. The economic and political environment, information task complexity, and organizational systems create a dynamic professional setting that is fundamentally different from the academic; professional preparation requires a holistic understanding of the *tasks* expected as well as a contextually relevant sense of the levels of *mastery* required. Relevant and workable definitions of IL in the workplace will necessarily require the input of business professionals who are familiar with both the contextualized tasks and the organizational expectations of mastery.

In our college's effort to prepare business majors for the information work they will be expected to do, an important first step was thus to clarify employer expectations with respect to information tasks and the mastery levels involved. The university had recently piloted a protocol for assessing career-relevant skill preparation of its students. The authors elected to use the methodology which allowed us to simultaneously determine employer expectations and gain a baseline assessment of graduates' skill levels.

## METHODOLOGY: THE TARGETED SKILLS GAP ANALYSIS

The assessment framework is derived from SERVQUAL (Parasuraman, Zeithaml & Berry, 1985; 1988), a commonly used model for measuring outcomes in service industries, including libraries, which have derived the LIBQUAL+ quality instrument from the same framework (Association of Research Libraries, 2013). In applying the SERVQUAL model to the service provided by an educational institution, the service provider is understood to be the university, while the regional employers seeking a ready workforce are understood as the customers. The service delivery process involves mutually constructed relationships, behaviors, and features, which might be understood by an education provider as the learning process. The resulting framework (Manning et al., 2012) includes seven potential gaps in the delivery of educational services to the State's employers.

Each of the gaps represents a point at which there can be differences in the expectations of service. Gap 1 illustrates the differences between what employers expect of new employees and what the University perceives those expectations to be. That is, a gap occurs when faculty do not know which skills are most critical to employers or the level of skill that would be required for success in the job.

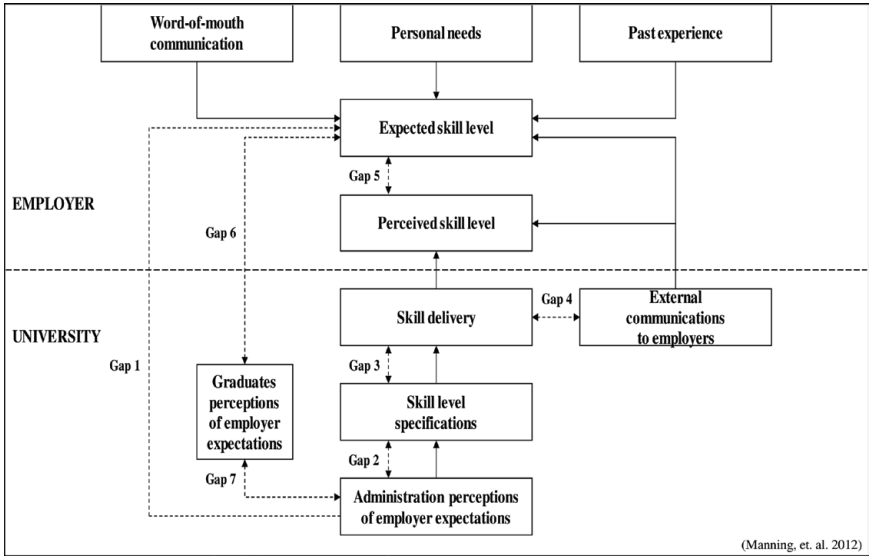


*Figure 3.1. Potential employer-university service gaps.*

Gaps 2, 3, and 4 represent potential discrepancies within the service provider's operation. Gap 2 represents a difference in the faculty understanding of an employer's skill requirements and the learning objectives within the curriculum, while Gap 3 indicates the degree to which instructional processes do not result in the targeted learning objectives. Gap 4 reflects an important insight from the service quality research: there can be discrepancies between the actual education delivered and the educational outcomes that are advertised by the institution. Although the model illustrates this as a single gap, it could be a complicated three-way interaction among a university's recruiting division, faculty perceptions, and actual learning outcomes.

The expectational discrepancy on the consumer side, represented here as Gap 5, has been shown to have the most impact on customer satisfaction (Parasuraman et al., 1988). This is the difference between the employers' *expectations* of graduates' skill levels and their *perceptions* of the actual skill levels possessed. This implies a somewhat different relationship from the way educational assessment is typically framed. When a student's performance in the classroom setting is assumed to indicate capacities or behaviors that will be observable upon graduation, the model is that of a student as a tangible product who carries certain assessable characteristics. Assuming the assessment process to have been accurate, any failure to express those characteristics after graduation is presumed to be a function of the student's personality or the employment context.

By contrast, the service model understands service delivery and the customer's perception of that service as simply two perspectives on the same transaction. That is, the student's *performance as perceived by the eventual employer* is the outcome of the educational service delivery process. There is no implicit transfer of responsibility from educator to student, but an integration of the teacher/learner process within a holistically understood educational outcome. As any educator will quickly realize, this represents a more complex situation than the more typical service industry product where a single person or employee team delivers the service. In an effort to represent this unique aspect of educational service delivery, two additional gaps are added to the original SERVQUAL model. Gap 6 illustrates differences between employers' expectations and graduates' expectations of the skills required for a position, and Gap 7 represents differences between the graduates' and faculty's expectations (Manning et al., 2012).

## TARGETED SKILLS AS SERVICE CHARACTERISTICS

Service dimensions were conceptualized in terms of the functional and technical aspects of the students' performance of their education within the workplace. Development of an appropriate set of general but workplace-relevant IL skills was a three-stage process. A first round of meetings was held with professional staff from the college's Business and Community Services division, a self-supporting unit that offers consulting and research services in marketing, entrepreneurship, economic development, and a variety of business operations throughout the state and the upper midwest (US).

Still working with our initial expectation that specific research tools or data resources would be professionally desirable, we were surprised by the broad range of critical thinking and communication skills that were actually sought. The ability to recognize what information would be needed to answer a specific business question was identified as the most problematic element of research skill. If given a specific information request, graduates were able to locate the data, but seemed unable to determine what information was needed in the first place. Further, their tendency was to try to solve the problem with whatever information they knew how to find, regardless of its appropriateness or adequacy for the task.

The second step was to incorporate the full range of IL skills into our scope, specifically seeking out those operationalized skill descriptions that had been developed in workplace contexts. The aim was to insure that we were addressing the full range of skills that might be desired by our statewide employer stakeholder group. Further, the utility of the survey items required that we use terminology that would be clear and consistent across a variety of companies

and industries. A matrix was developed that lined up aspects of IL as described by multiple resources. Sources included four academic efforts (Association of American Colleges and Universities, n.d.; Association of College and Research Libraries, 2000; Goad, 2002; Head, 2012), four that utilized research with business contexts (Coplin, 2003; Graveline, 2013; Malcom, 2012; Sokoloff, 2012), and two industry-specific lists for competitive intelligence and information technology (Chung & Ripperger, 2013; Committee on Information Technology Literacy of the National Research Council, 1999).

The final step was to partner with professionals drawn from the college's alumni community. We wished to verify our interpretation of each skill description, insuring that we understood the behavior in a business context and that we were describing it in a way that would be clearly understood by our employer respondents. As a result of these meetings, the skill matrix was reordered somewhat to reflect a more common job-related task sequence, and wording was changed to reflect some important business distinctions. Initial steps in the research process involved gathering *data*, while *information* was the preferred term for the product of evaluation and integration steps that occurred later in the process. A distinction was also introduced between *secondary* and *primary* research, in large part because secondary research would typically be conducted to determine the need for additional primary research. Finally, communication skills were expanded to reflect what employers perceived as distinct skills involved in *choosing* just that information appropriate to a specific audience or context and effectively *delivering* the result. The categories involved in the ethical use of information were deemed acceptable, although the point was made that attribution of sources was exclusively related to secondary research tasks, while the ethical issues of most importance to the business environment had to do with primary research, including ethical gathering of data, as well as confidentiality and ethical dissemination of information. The final list of 24 skills was used to determine gaps between employer expectations and employee readiness.

**IL Skills Defined by Employers**

*Know*

1. Detects the need for research through regular workplace interaction
2. Recognizes and articulates a research question
3. Identifies appropriate secondary research sources

*Access*

4. Develops a research plan
5. Considers practical costs/benefits of various research methods
6. Identifies appropriate primary research methods

7. Able to effectively use appropriate secondary research resources, technologies
8. Uses appropriate data recording, storage methods

*Evaluate*

9. Evaluates information and sources according to stated criteria
10. Evaluates information for fallacies and limitations with deductive and inferential logic
11. Accurately extracts data from sources
12. Synthesizes information from multiple sources
13. Recognizes value of information with respect to what is already known
14. Recognizes data that are sensitive to social, cultural, personal influence or bias
15. Revises search methods on the basis of information assessment

*Use*

16. Selects contextually relevant new knowledge for communication to others
17. Clearly, effectively communicates research results to others
18. Able to engage in meaningful interpretation of data with others
19. Uses analytical methods to utilize information
20. Uses information to make strategic business decisions

*Ethics*

21. Recognizes ethical and legal issues of information gathering
22. Follows professional and/or legal guidelines for ethical behavior
23. Follows appropriate rules for attribution and acknowledgement of sources
24. Recognizes moral and ethical implications of new knowledge

## PRIORITIZING THE SERVICE GAPS

The service gaps for each skill dimension were measured with survey questions that asked respondents to indicate both the *expected* level of skill and their *perceptions* of the actual skill delivered. The average difference score provides a measure of the gap for that dimension. This measure alone is not sufficient to prioritize management attention. A large gap could exist in an area that is not particularly important to the customer, and management resources might be more effectively spent on reducing a smaller gap in an area of greater customer concern. The Targeted Skills Gap Analysis (Manning et al., 2012) thus calls for results of the expectations/perceptions gap survey to be plotted on a two-dimensional decision matrix that displays the gap in customer expectations as well as the relative importance to the customer, prioritizing those service elements that are most deserving of management attention.

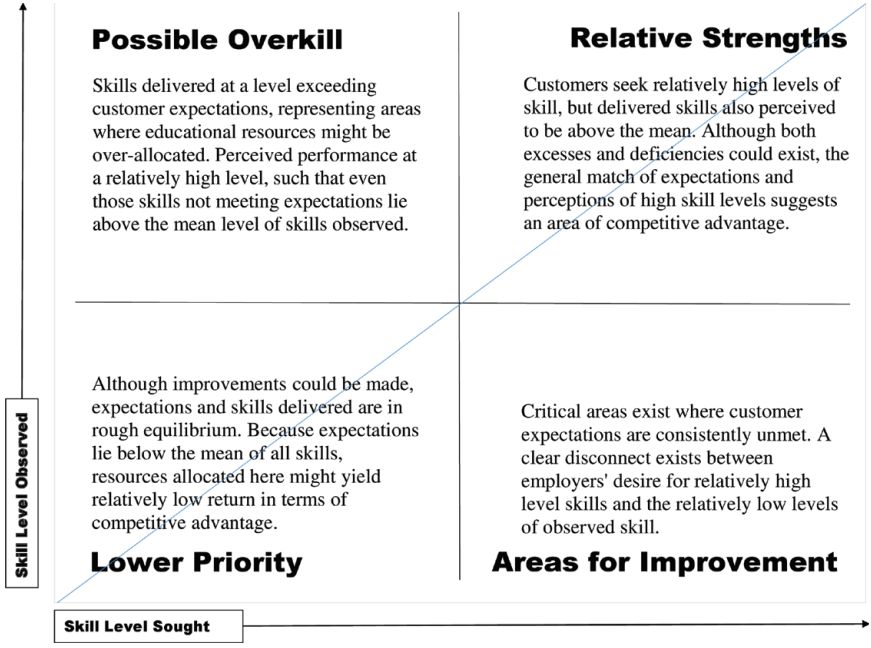


*Figure 3.2. Skill gap analysis quadrants.*

The service expectation, the skill level sought in University graduates, is plotted on the x-axis; the perception of the skill performance actually received from those same graduates is plotted on the y-axis. A perfect match is represented as the dashed diagonal line, x=y, and the perceived gap appears as the vertical distance between the dashed diagonal line and the plotted point. Four decision quadrants are then created by drawing vertical and horizontal lines at the mean values of skill levels sought and delivered. Skills for which customers desire a level of skill higher than the mean are deemed more salient to their operations, while observed skills that are below the mean are areas of more concern. The resulting quadrants assist management in prioritizing the gaps that require attention.

A full map of the service delivery process would involve data collection on each of the expectational gaps discussed above, but for practical reasons, most data collection efforts focus first on customers' perceptions and satisfaction with the service experience, designated as Gap 5. The results drive management investigation of the remaining gaps to determine causal relationships and develop effective solutions. We sought the most salient measure of employer satisfaction with the university's ability to provide information literate employees to create

a baseline measure, and we will use these results to refine the IL skill definitions before conducting research with respect to faculty perceptions, alumni perceptions, current student self-efficacy, and direct skill assessment.

## RESULTS: IDENTIFYING THE SKILLS GAP

With IRB approval, a web-based survey was distributed by email to the university Career Center's list of 1,306 employers and recruiters. Although this list includes some education and government employers, a large majority of Career Center activities involve business majors. Given our desire to create a skill set that could be generalized across multiple industries and business functions, we felt all employers could be included without distorting the results. We also invited the recipients, many of whom are recruiters associated with the human resource function, to forward the survey link to first-line managers within their organizations. Survey data was collected from 168 recipients, a 12.9% overall response rate. Respondents worked for companies that ranged in size from under 100 employees (46.7%) to over 1,000 (21.2%). New employees had been hired in all O*Net career clusters, although business, management, and administration and marketing, sales, and service dominated the mix.

Some respondents did not provide ratings for one or more skills, suggesting that not all entry-level jobs necessarily encompass the full scope of IL, and for each item at least a few respondents selected "don't know" as their answer. While total numbers of responses on each item differ, their range from 74 to 106 was deemed both adequate and sufficiently balanced. The average ratings of employer expectations and perceived new employee skill were calculated for each (See Tables 3.1 through 3.4) and plotted into quadrants of the Skill Gap Analysis (Figure 3.3).

Overall, the results demonstrated a relatively consistent result across all elements of IL. Employers expected only "moderate" IL skills, averaging only a 2.09 on our five-point scale. Across all skill categories, entry-level employees were not fully meeting employer expectations, but in no case was the gap larger than .51, barely more than half a rating category. Employers found new graduates to be working at the moderate level desired, albeit not at optimal performance. An evaluation of the results by skills area, along with comments from respondents, provides additional insight.

In the general category of knowing when to seek information, employers acknowledge the need to learn the business context before a new employee can be fully productive. As one respondent summarized it, "Knowledge of college students is not industry specific. The [research] tools used vary by company, and it would be impossible to teach every tool to students," further, says another, "We can teach some technical [skills]." Employers see a key skill as the social

**Table 3.1: Knowing information needs**

| | Average Level Expected | Average Level Observed | Skill Gap |
|---|---|---|---|
| 1. Detects the need for research through regular workplace interaction | 2.10 | 1.69 | 0.41 |
| 2. Recognizes and articulates a research question | 2.07 | 1.63 | 0.44 |
| 3. Identifies appropriate secondary research sources | 1.91 | 1.54 | 0.37 |
| All knowledge awareness skills | 2.03 | 1.62 | 0.41 |

*Rating Scale: None (0), Novice (1), Moderate (2), Advanced (3), Master (4), Expert (5)*

**Table 3.2. Accessing information**

| | Average Level Expected | Average Level Observed | Skill Gap |
|---|---|---|---|
| 4. Develops a research plan | 1.80 | 1.54 | 0.26 |
| 5. Considers practical costs/benefits of various research methods | 1.77 | 1.42 | 0.35 |
| 6. Identifies appropriate primary research methods | 1.82 | 1.58 | 0.24 |
| 7. Able to effectively use appropriate secondary research resources, technologies | 1.93 | 1.70 | 0.23 |
| 8. Uses appropriate data recording, storage methods | 2.02 | 1.83 | 0.20 |
| All information access skills | 1.87 | 1.61 | 0.26 |

*Rating Scale: None (0), Novice (1), Moderate (2), Advanced (3), Master (4), Expert (5)*

capacity that allows new employees to engage productively in "regular workplace interaction" such that they are able to read the implicit and contextual cues that cause them to "detect the need for research." Respondents named, in particular, asking questions, teamwork, and getting along well with others.

In the realm of accessing information, employers expected slightly less than moderate skills, and graduates came closest to meeting expectations in this area. Employers were most concerned with an ability to document results, with one noting, "We find that typically college grads are enthusiastic about doing the research and not so much on documenting it in a way that will be helpful to others in the future." Although employee skills rated lower than moderate in all other access skills, several employers admitted that their organizations' planning or cost analysis practices were also less than optimal.

**Table 3.3. Evaluating information**

| | Average Level Expected | Average Level Observed | Skill Gap |
|---|---|---|---|
| 9. Evaluates information and sources according to stated criteria | 2.18 | 1.86 | 0.32 |
| 10. Evaluates information for fallacies and limitations with deductive and inferential logic | 1.89 | 1.56 | 0.33 |
| 11. Accurately extracts data from sources | 2.16 | 1.83 | 0.34 |
| 12. Synthesizes information from multiple sources | 2.08 | 1.74 | 0.33 |
| 13. Recognizes value of information with respect to what is already known | 2.19 | 1.81 | 0.38 |
| 14. Recognizes data that are sensitive to social, cultural, personal influence or bias | 2.11 | 1.74 | 0.37 |
| 15. Revises search methods on the basis of information assessment | 2.05 | 1.70 | 0.35 |
| All information evaluation skills | 2.10 | 1.75 | 0.35 |

*Rating Scale: None (0), Novice (1), Moderate (2), Advanced (3), Master (4), Expert (5)*

Employers consistently desired moderate information evaluation skills. As suggested by previous research in workplace IL, however, the focus seems to be on reporting the results of evaluation, distinguishing those tasks from whatever cognitive processes are involved in the evaluation of information. As one employer put it, "Not all positions require a research component. However, all positions require problem-solving skills." The ability to evaluate data for social, cultural, and personal bias is rather obviously context-bound, but comments suggest that employers understand each of these skills in terms of relationship and communication skills. Employers emphasized the need for "understanding the corporate culture and doing it the way that is generally accepted by our company" as well as functional elements of "grammar and spelling mistakes" in the written documents used to report the evaluation.

The largest gap in the uses of information involved the analytical methods, but the lowest expectations lie in use of information for business purposes. The highest expectations involved graduates' ability to communicate their findings to others. Comments further emphasized respondents' concern for communication with general remarks that "people skills and exceptional communication skills are absolutely necessary for every employee" and more specific complaints that new employees were unable to format their communications so that colleagues could easily use the information being provided.

**Table 3.4. Using information**

| | Average Level Expected | Average Level Observed | Skill Gap |
|---|---|---|---|
| 16. Selects contextually relevant new knowledge for communication to others | 2.15 | 1.83 | 0.32 |
| 17. Clearly, effectively communicates research results to others | 2.28 | 1.84 | 0.44 |
| 18. Able to engage in meaningful interpretation of data with others | 2.21 | 1.75 | 0.46 |
| 19. Uses analytical methods to utilize information | 2.18 | 1.67 | 0.51 |
| 20. Uses information to make strategic business decisions | 2.03 | 1.63 | 0.40 |
| All information use skills | 2.17 | 1.74 | 0.43 |

*Rating Scale: None (0), Novice (1), Moderate (2), Advanced (3), Master (4), Expert (5)*

**Table 3.5. Information ethics**

| | Average Level Expected | Average Level Observed | Skill Gap |
|---|---|---|---|
| 21. Recognizes ethical and legal issues of information gathering | 2.27 | 1.87 | 0.40 |
| 22. Follows professional and/or legal guidelines for ethical behavior | 2.55 | 2.23 | 0.31 |
| 23. Follows appropriate rules for attribution and acknowledgement of sources | 2.31 | 2.00 | 0.31 |
| 24. Recognizes moral and ethical implications of new knowledge | 2.28 | 1.94 | 0.34 |
| All information ethics skills | 2.35 | 2.01 | 0.34 |

*Rating Scale: None (0), Novice (1), Moderate (2), Advanced (3), Master (4), Expert (5)*

Employers' highest expectations lay in the area of information ethics, but this was also the only area in which new employees possessed moderate skills, overall. Confidentiality was the largest ethical concern, especially with respect to the careless use of social media.

Each of the 24 skill gaps were plotted onto the Skill Gap Analysis Quadrants. The resulting diagram, designed to highlight areas for managerial attention, finds the entire scope of IL to be highly clustered.

The average level of skill sought, 2.09, and the average level of skill observed, 1.74, define the vertical and horizontal midlines, respectively. Entry-level


*Figure 3.3. Plotted skill gap results.*

employees are performing all skills below the diagonal, which represents a match between skills and expectations, but the gap is not large. Further, IL skills fall primarily in the *relative strength* and *lower priority* quadrants. That is, although all are lower than desired, those skills that are rated the lowest, generally falling in the area of information access, are also those least expected by employers. Meanwhile ethics skills, expected to be somewhat higher, are also observed to be somewhat higher.

Just three skills fall in the *areas for improvement* where the employers' expectations are the highest (i.e., at or above the overall average of 2.09) but skills are observed to be the lowest (i.e., at or below the overall average 1.74):

- Detects the need for research through regular workplace interaction (Skill #1, Know)
- Recognizes data that are sensitive to social, cultural, personal influence or bias (Skill #14, Evaluate)
- Uses analytical methods to utilize information (Skills #19, Use)

These areas of concern and employer comments are similar to those reported by the Project Information Literacy Research Report on college graduates (Head, 2012). Of the 4 competencies rated as highly needed by employers, but rarely demonstrated by recent hires (p. 12), two were identified by the employers in this study as well. The communication aspects of "engaging team members during the research process" are reflected in skills #1 and #18, while "finding patterns and making connections" seems to appear as skills #19, #20, and possibly #18 as well. One area, "retrieving information using a variety of formats," appears to be encompassed by skill #7, but the fourth, "taking a deep dive into the 'information reservoir,' " does not appear to have a direct corollary. It is possible that our methodology, which was specific to the skill levels of new college graduates, might have reduced employer expectations of the more independent research skills implied in that descriptor.

## DISCUSSION

Based on the survey data, the College's Professional Readiness Program staff will be developing relevant and effective preparation in the area of business research practices. The results seem to lead us toward action in four areas:

1. *Frame instruction in terms of the information tasks that will be common for new employees.* One of our most interesting findings was that employers perceived new graduates as consistently but only slightly less qualified than expected. Given the concerns reported in previous research, this was gratifying, but probably says more about the survey methodology than about students' preparation. Because we had taken steps to describe elements of IL with a generic but typical business vocabulary, we believe that employers were responding in terms of generic but recognizable tasks. Just as workers' skills cannot be easily differentiated from the overall information experience, employers' evaluation of information skills cannot be easily differentiated from overall performance of a task.

2. *Combine IL with communication skills.* Employers see information-related skills as different and perhaps more limited than the "soft" skills of critical thinking and communication, which might still be reported as problematic. A communication skill survey is planned, and the comparison will be informative. In the meantime, the creation of task-related skill definitions suggests that if academic institutions are going to prepare students to participate effectively, they cannot neglect the communicative and problem-solving context in which information is used. As Marcum (2002) puts it, "librarians must ratchet up their standards and expectations from literacy to sociotechnical fluency" (p. 20).

3. *Provide IL skills in a business context.* A consistent point made in both published research and conversations with professionals was that information

use is fully embedded in a specific organizational context. This does not seem to mean that skills are impossibly specific; we were able to develop a set of sufficiently generic business tasks to create a survey instrument that was usable across multiple industries and job titles. We nevertheless believe that students will be better equipped to transfer skills if the terminology and task vocabulary are consistently maintained across academic and workplace contexts.

4. *Continue the collaboration.* Finally, the most salient conclusion is probably the most straightforward: we must continue to work closely with the professional stakeholders who can provide contexts, terminologies, experiential learning, mentoring, and coaching. To the extent that IL develops through a process of socialization into a discursive community, the involvement of that community is crucial to the success of any instruction.

## IMPLICATIONS FOR RESEARCH IN IL

The *Framework for IL* addresses the contextualized nature of IL that we have described here with six "frames" that are relevant to information use across academic disciplines as well as to civic and professional contexts. Our project suggests that research must continue to explore the complicated nature of information use in context. As our employer perceptions demonstrate, there seems to be no effective way to separate IL from the social skills that allow individuals to gain that literacy within a knowledge community. Nor are there useful distinctions between the effective use of information and its effective application in a specific context. We have demonstrated here that employers perceive IL in terms of purposeful information use, and we expect that the same will be true of faculty and student perceptions of their instructional and learning activities. Further, expectations of IL vary with a trajectory of experience, maturity, and socialization into the rhetorical practices of a community.

For those of us who work to prepare students for non-academic futures, it is not enough to recognize that academic tasks are different from workplace tasks, or even to translate academic skills into a more typically professional vocabulary. Neither addresses the more important step of preparing students to undertake the process of joining a socially and rhetorically complex workplace community. As with any other professional behavior, IL develops as new workers learn to pay attention to the salient features of their environment and respond in accordance with social and rhetorical norms.

Some argue that "the critical ground for information literacy is the workplace and not the education sector" (Lloyd, 2011, p. 280), but that does not imply there is no research to be done within the academic environment. Rolf Norgaard and Caroline Sinkinson (Chapter 1, this collection) review the necessary relationships

between IL and writing instruction, as well as the historical and institutional barriers that conspire against students' participation in the rhetorical community that is academia. As we solve these pedagogical problems, we are poised to learn a great deal about how individuals master threshold concepts to negotiate an information context and successfully adopt normative practices. Students entering the university are learning to recognize the epistemological frameworks of their new academic community in the same way any worker learns to recognize and effectively use information to accomplish relevant tasks within a specific context. We can understand how that happens—or doesn't happen—not merely to better prepare students for academic work, but to translate that understanding into general principles of IL as the *process* of becoming literate in the ways of a knowledge-using community.

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