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RESEARCH REPORT

Using the Occupational Network Database to Assess and Improve English Language Communication for the Workplace

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For native and nonnative English speakers, employment increasingly requires proficiency in communication, given its critical role in employees' ability to successfully carry out work-related activities. Although communicating competently is important for employability, survey findings have suggested that employers believe that colleges are not teaching communication skills sufficiently and are not preparing students adequately for success in their future workplaces. To better inform student preparation and workforce readiness in the United States, we examine (a) which communication skills and language abilities matter more for employment performance and (b) how frequently communicative activities (e.g., face-to-face, telephone, e-mail) occur across job zones. To address these objectives, we analyzed data from the U.S. Department of Labor Occupational Network (O*NET) database, which houses data on the skills and abilities employees need for successful employment and the skills employers search for in employees and which serves as an extensive resource to inform job analysis. We found differences regarding which communication skills matter by job zone. There was agreement across job zones regarding the importance of oral comprehension. On average, respondents across job zones agreed that it matters for more than 70% of jobs. In contrast, writing matters for more than 70% of jobs only in Job Zone 5 (i.e., occupations requiring more than a bachelor's degree). Study implications suggest that improved training and assessment of workplace English communication skills requires providing learners with opportunities to practice the tasks and types of communication targeted to their job zones.

Keywords Workforce readiness; Occupational Network; O*NET; workplace communication

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In both national and international businesses in English-speaking countries, English proficiency is increasingly required for successful performance of workplace activities, elevating the importance for prospective employees to have command of English for employability (Oliveri & Tannenbaum, 2019). Chiswick and Miller (2010) also revealed that proficiency in English has an impact on earnings for both native and foreign-born individuals in the United States, as increased proficiency in English led to an increase in earnings for native-born and foreign-born employees alike. The researchers noted that these changes were "the equivalent of the earnings effects associated with two years of schooling for the native-born and almost six years of schooling for the foreign-born" (p. 368).

Although there is agreement on the importance of English communication for successful workplace performance, respondents participating in employer surveys (e.g., Casner-Lotto & Barrington, 2006; Hart Research Associates, 2010) have commented that a "lack of basic writing skills and effective business communication skills appears to be a major stumbling block among new entrants — even at the college level" (Casner-Lotto & Barrington, 2006, p. 38). These results suggest that students may be underprepared for workplace communication as shown in results of employer surveys. For instance, results of a survey conducted by Hart Research Associates (2010) with more than 302 employers revealed that only 28% of respondents thought 4-year higher education institutions were able to prepare students for the workplace adequately. This result highlights the need for rethinking the skills and activities that are the focus of curricula leading to workplace preparation (Oliveri & Markle, 2017).

Natural next questions are, (a) Which communication skills and abilities are important for the workplace? and (b) What types of social interactions (e.g., face-to-face communications, dialogs, discussions) and communications do people engage in more frequently at work? Answers to these questions would help inform workplace preparation by guiding teachers and employers to better focus on those skills for instruction and training.

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A review article by Bhatia and Bremner (2012) pointed us in the right direction by informing us not only of what type of communication is needed but also what type of communication is insufficient:

> Communication is not simply a matter of putting words together in a grammatically correct and rhetorically coherent textual form, but more importantly, one of having the desired impact on the members of a specifically relevant discourse community, and of recognizing the conventions for how the members of that community negotiate meaning in professional documents. In this sense, communication is more than knowing the semantics of lexico-grammar; in fact, it requires an understanding of why the members of a business or disciplinary community communicate the way they do. (p. 412)

Bhatia and Bremner suggested that workplace communication involves more than grammar and includes the coherent use of argumentative or rhetorical stances to recognize the conventions for relating well with members within a particular community or discipline to successfully negotiate meaning in professional contexts. Burstein, Elliott, and Molloy (2016) also highlighted the importance of understanding audience, context, and the discipline-specific knowledge of individuals' targeted trades or professional milieux. For example, if students are to learn how to read and write a research article for publication in their disciplinary field, they should not only understand the vocabulary, collocations, discourse signals, and frameworks used for such texts but also be familiar with the way such linguistic practices function within their disciplines.

Oliveri and Tannenbaum (2019), based on an analysis of critical incidents from human resource managers in technology-rich environments, have suggested that successful workplace communication also involves having competencies in interactive communications, such as conversation, dialog, collaboration, and teamwork. Candlin (2002), Clyne (1994), Marra (2012), and Timpe (2013) suggested that successful workplace communication involves having competencies in the sociopragmatic and discursive aspects of language to render explicit the context in which language is used at work, including understanding how to communicate with diverse audiences, such as colleagues, supervisors, or clients. Timpe explained that sociopragmatic errors play an elevated role in communication breakdowns as compared to the linguistic (phonological, lexical, and morphosyntactic) features that are often emphasized in English classrooms, leading learners to be poorly prepared to successfully lead communicative transactions with diverse audiences and leaving listeners with negative impressions of the speakers.

Foshay and Haley (2017) further suggested that improved learner preparation for the workplace may require including tasks and assessments aligned to the workplace based on analyses of workplace contexts and activities. Along these lines, Bachman and Palmer (2010), Douglas (1997), and Foshay and Haley (2017) argued for the importance of developing assessments that are competency-based rather than uniquely knowledge-based, informed by a richer understanding of the competencies, knowledge, skills, and attitudes relevant to succeeding in real-world workplace contexts.

In this research report, we seek to identify the types of skills, abilities, and modalities that matter to successful workplace communication. The goal is to inform instruction and assessment of workplace English communication competencies by developing tasks that are better connected to real-world workplace contexts and situations. To this end, we examined the Occupational Network (O*NET) database, which is sponsored by the U.S. Department of Labor, Employment, and Training Administration, to inform job analysis based on responses from job incumbents across a large number of occupations. Our analyses of the O*NET provide information on how important communication is to the workplace; the types of knowledge, skills, abilities, and work activities related to communication that matter to the workplace; and the ways in which language is used in the workplace. We suggest that this information is useful in developing tasks and assessments to educate employees on workplace English communication.

Method

Data

The Occupational Information Network

The O*NET is a publicly available database of occupational information regarding employees' knowledge, skills, abilities, and work styles that are relevant to job characteristics associated with more than 970 occupations. Employers use the O*NET to develop effective job descriptions quickly and easily, define employee and/or job-specific success factors, align organizational development with workplace needs, and refine recruitment and training goals. The database is updated

annually to ensure that the occupational descriptions are up to date. Data are collected from random samples of employers and job incumbents in various occupations.

The O*NET uses standardized questionnaires for data collection that contain items that ask about the job qualifications for an occupation, aspects of the job, and interests of a typical worker. The questionnaire development occurs in two stages: (a) A random sample of businesses expected to employ workers in the targeted occupations are identified and (b) a random sample of workers in those occupations within those businesses is selected to complete the questionnaires. To protect their confidentiality, the O*NET does not provide any demographic information about the respondents (e.g., age, gender, race/ethnicity) beyond information such as industry name or type. Therefore, other than comparisons of occupations across jobs or industries, subgroup analyses cannot be conducted with O*NET data.

In this study, we analyzed data from O*NET (v.21.2) questionnaires, which were selected by reviewing the worker- and job-oriented characteristics from the O*NET content model and identifying the variables that related to communication, such as reading, writing, speaking, and listening. The content model provides a theoretically and empirically sound system that includes critical work- and job-related information. Worker-oriented characteristics refer to enduring characteristics and the capacity to acquire knowledge, skills, and abilities required for effective work performance. Examples include skills, abilities, occupational interests and interest profiles, work values, work styles, and cross-functional skills. Job-oriented characteristics include variables that define and describe the general characteristics of occupations that may influence occupational requirements, such as labor market information, occupational outlook, future labor force characteristics of occupations, and occupational context.

We selected three questionnaires from the worker-oriented characteristics cluster — (a) knowledge, (b) skills, and (c) abilities — and one questionnaire (work context) from the job-oriented characteristics. The work context describes the physical and social characteristics of the organization that influence how people do their work and provides details regarding the social interactions (e.g., face-to-face communications, dialogs, and discussions) related to how people communicate in the workplace. In what follows, we explain each of the questionnaires and define the variables selected from each questionnaire in greater detail.

Knowledge, Skills, and Abilities Questionnaires

As we elaborate later, the knowledge, skills, and abilities questionnaires asked job incumbents to rate how important and difficult they believed each variable was to their current job on a 5-point scale ranging from 1 (*not important*) to 5 (*extremely important*). The complexity level scale is a 7-point scale ranging from lowest to highest levels of complexity. Example tasks are provided for only three scale points to illustrate the complexity of tasks related to the variable to make it easier for a respondent to choose the level associated with his or her job. Thus, there are scale points with no descriptors.

We describe each questionnaire, the communication-related variables (also referred to as descriptors) selected, the scales used, the level of complexity of the descriptors, and the sample tasks at each scale point given to the job incumbents to rate the level of complexity of the descriptors included. Table 1 summarizes the questionnaires and variables analyzed and provides a definition of the variables as described in O*NET.

The Knowledge Questionnaire

The knowledge questionnaire asked 33 questions about sets of facts and principles needed to solve occupation-related problems and issues. Only one question from the knowledge questionnaire was related to English communication; it more specifically asked about the importance of using the English language to carry out someone's occupation. English language was defined as the knowledge of the structure (meaning and spelling of words, rules of composition, and grammar) and content of the English language needed to carry out a job. The example tasks given for the complexity level scale included (a) Level 2, "Write a thank-you note"; (b) Level 4, "Edit a feature article in a local newspaper"; and (c) Level 6, "Teach a college English class."

The Skills Questionnaire

The skills questionnaire asked 35 questions about the abilities needed to perform different functions possibly relevant to a given job. It asked incumbents to rate the level and importance of reading comprehension, active listening, writing, and speaking skills.

Table 1 Communication-Related Variables From the Knowledge, Skills, and Abilities Questionnaires

Questionnaire name and definition	Variables used and definitions
Knowledge: Questions related to sets of facts and principles to address occupation-related problems and issues	English language: Knowledge of the structure and content of the English language, including the meaning and spelling of words, rules of composition, and grammar
Skills: Questions asked about the abilities needed to perform different job-related functions	Reading comprehension: Understanding of written sentences and paragraphs in work-related documents
	Writing: Communicating effectively in writing as appropriate for the needs of the audience
	Active listening: Giving full attention to what others say, taking time to understand the points made, asking questions as appropriate, and not interrupting at inappropriate times
	Speaking: talking to others to convey information effectively
Abilities: Questions asked about enduring talents that may help individuals do a job	Oral comprehension: Listening to and understanding information and ideas presented through spoken words and sentences
	Oral expression: Communicating information and ideas in speaking so others will understand
	Speech recognition: Identifying and understanding the speech of another person
	Speech clarity: Speaking clearly so others can understand you
	Written comprehension: Reading and understanding information and ideas presented in writing
	Written expression: Communicating information and ideas in writing so others will understand
	Auditory attention: Focusing on a single source of sound in the presence of other distracting sounds

Reading comprehension was defined as understanding written sentences and paragraphs in work-related documents. The example tasks included (a) Level 2, "Read step-by-step instructions for completing a form"; (b) Level 4, "Read a memo from management describing new personnel policies"; and (c) Level 6, "Read a scientific journal article describing surgical procedures."

Writing was defined as communicating effectively in writing as appropriate for the needs of the audience. The example tasks included (a) Level 2, "Take a telephone message"; (b) Level 4, "Write a memo to staff outlining new directives"; and (c) Level 6, "Write a novel for publication."

Active listening was defined as giving full attention to what others are saying and taking time to understand points made, asking questions, and not interrupting at inappropriate times. The example tasks included (a) Level 2, "Take a customer's order"; (b) Level 4, "Answer inquiries regarding credit references"; and (c) Level 6, "Preside as judge in a complex legal disagreement."

Speaking was defined as talking to others to convey information effectively. The examples included (a) Level 2, "Greet tourists and explain tourist attractions"; (b) Level 4, "Interview applicants to obtain personal and work history"; and (c) Level 6, "Argue a legal case before the Supreme Court."

The Abilities Questionnaire

The abilities questionnaire asked 52 questions related to enduring talents individuals may have to help them do a job. As indicated in Table 1, it asked incumbents to rate the level and importance of seven communication-related abilities.

Oral comprehension was defined as the ability to listen to and understand information and ideas presented through spoken words and sentences. The example tasks included (a) Level 2, "Understand a television commercial"; (b) Level 4, "Understand a coach's oral instructions for a sport"; and (c) Level 6, "Understand a lecture on advanced physics."

Oral expression was defined as the ability to communicate information and ideas in speaking so others will understand. The example tasks included (a) Level 2, "Cancel newspaper delivery by phone"; (b) Level 4, "Give instructions to a lost motorist"; and (c) Level 6, "Explain advanced principles of genetics to college freshmen."

Speech recognition was defined as the ability to identify and understand someone else's speech. The example tasks included (a) Level 2, "Recognize the voice of a coworker"; (b) Level 4, "Identify a former customer's voice over the telephone"; and (c) Level 6, "Understand a speech presented by someone with a strange accent."

Speech clarity was defined as the ability to speak clearly so others will understand the speaker. The example tasks included (a) Level 1, "Call numbers in a bingo game"; (b) Level 4, "Make announcements over the loudspeaker at a sports event"; and (c) Level 6, "Give a lecture to a large audience."

Written comprehension was defined as the ability to read and understand information and ideas presented in writing. The example tasks included (a) Level 2, "Understand signs on the highway"; (b) Level 4, "Understand an apartment lease"; and (c) Level 6, "Understand an instruction book on repairing a missile."

Written expression was defined as the ability to communicate information and ideas in writing so others will understand. The example tasks included (a) Level 2, "Write a note to remind someone to take food out of the freezer"; (b) Level 4, "Write a job recommendation for a subordinate"; and (c) Level 6, "Write an advanced economics textbook."

Auditory attention was defined as the ability to focus on a single source of sound in the presence of other distracting sounds. The example tasks included (a) Level 2, "Listen to a lecture while people nearby are talking"; (b) Level 4, "Listen for your flight announcement at a busy airport"; and (c) Level 6, "Listen to instructions from a coworker in a noisy saw mill."

The Work Context Questionnaire

The work context questionnaire contained 57 questions designed to collect information about working conditions, including questions about the work environment, the pace of work, and interactions with others. Nine of the 57 questions relate to workplace communication and asked how frequently employees engage in various types of communication, such as face-to-face discussions, conversations on the phone, and contact with others. The rating scale of the work context questionnaire was a 5-point scale. Table 2 lists each of the questions and scale points in the work context questionnaire.

Job Zones

The O*NET organizes data by what are referred to as *job zones*—groups of occupations that have similar requirements based on the attained level of education, related work experience, on-the-job training that employees need to do the work, and job industry in which groups of jobs may fall. As an example, Job Zone 1 occupations require less than a high school degree, while Job Zone 5 occupations require education more than a bachelor's degree. Table 3 lists examples of occupations in each job zone and describes the educational requirements for each job zone.

We considered the differences that exist for English language communication across different types of occupations by job zone. For the data set used for this study, there were 964 respondents across Job Zones 1–5. Job Zone 1 had 40 respondents, Job Zone 2 had 283 respondents, Job Zone 3 had 254 respondents, Job Zone 4 had 228 respondents, and Job Zone 5 had 159 respondents.

Results

In what follows, we report findings from the questionnaires related to the average importance and complexity level ratings reported by job zone and also describe how frequently particular types of communications occur in the workplace. To conclude, we provide an overview of the implications of our findings for teaching and assessing workplace English communication.

The Knowledge Questionnaire

Figure 1 shows the average importance ratings for each of the five job zones, as endorsed for the English language question selected from the knowledge questionnaire. There is a steady increase in the value of the importance rating scale from Job Zones 1 to 5. On average, respondents from Job Zones 2 and 3 indicated that the English language was "important" for employees' performance of their current jobs. In Job Zones 4 and 5, on average, respondents indicated that the English language was "very important" for employees' performance. The standard error bars are also shown. They range from .03

Table 2 Communication-Related Descriptors in the Occupational Network Database Work Context Questionnaire

	Rating				
Question	1	2	3	4	5
How often does *your current job* require face-to-face discussions with individuals and within teams?	Never	Once a year or more but not every month	Once a month or more but not every week	Once a week or more but not every day	Every day
How frequently does *your current job* require telephone conversation?	Never	Once a year or more but not every month	Once a month or more but not every week	Once a week or more but not every day	Every day
How much contact with others (by telephone, face-to-face, or otherwise) is required to perform *your current job*?	No contact with others	Occasional contact with others	Contact with others about half the time	Contact with others most of the time	Constant contact with others
In *your current job*, how important are interactions that require you to coordinate or lead others in accomplishing work activities (not as a supervisor or team leader)?	Not important at all	Fairly important	Important	Very important	Extremely important
In *your current job*, how important are interactions that require you to deal with external customers (as in retail sales) or the public in general (as in police work)?	Not important at all	Fairly important	Important	Very important	Extremely important
How important are interactions that require you to work with or contribute to a work group or team to perform *your current job*?	Not important at all	Fairly important	Important	Very important	Extremely important
How frequently does *your current job* require electronic mail?	Never	Once a year or more but not every month	Once a month or more but not every week	Once a week or more but not every day	Every day
How frequently does *your current job* require written letters and memos?	Never	Once a year or more but not every month	Once a month or more but not every week	Once a week or more but not every day	Every day
How frequently does *your current job* require public speaking (one speaker with an audience)?	Never	Once a year or more but not every month	Once a month or more but not every week	Once a week or more but not every day	Every day

Table 3 Participant Characteristics

Job zone	Educational requirement	Sample occupations
1	Less than high school	Cashier, taxi driver, waiter
2	High school diploma	Janitor, bank teller, transportation security screener
3	High school plus	Head chef, building inspector, paralegal assistant
4	Bachelor's degree	Computer network architect, engineer, pilot
5	Bachelor's degree plus	Scientist, health care specialist, pharmacist

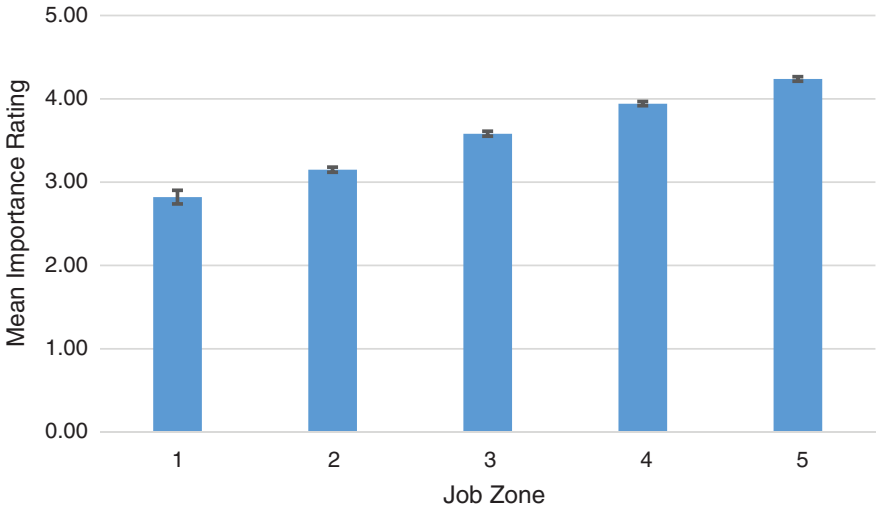

Figure 1 Knowledge of English language required for Job Zones 1–5 by importance rating. The bars above the columns for each job zone show the standard errors.

for Job Zones 2–5 to .08 for Job Zone 1, which had a smaller sample ($n = 40$) as compared to the other job zones, each of which had more than 150 respondents.

Figure 2 shows the level of English language required to fulfill one's current job. On average, respondents in Job Zones 1 and 2 reported requiring a level of English knowledge above Level 2, the level needed to "write a thank-you note." On average, respondents in Job Zones 4 and 5 reported requiring a level of English needed to "edit a feature article in a local newspaper." The standard error bars are also shown. They range from .04 for Job Zones 2–4 to .05 for Job Zone 5 and .11 for Job Zone 1.

The Skills Questionnaire

Figure 3 shows the average importance ratings endorsed for the four questions from the skills questionnaire, which asked communication-related questions regarding (a) reading comprehension, (b) writing, (c) speaking, and (d) active listening necessary skills needed to perform occupations at Job Zones 1–5. On average, respondents in Job Zones 1–5 rated speaking and active listening skills at or above a 3, suggesting that those two skills are important across all job zones. On average, respondents in Job Zones 1 and 2 rated reading comprehension and writing below 3, whereas respondents in Job Zones 4 and 5, on average, rated all four skills close to very important with a rating of 4 or close to 4.

Like the importance scale, Figure 4 shows an increase in the complexity level of the four skills needed to fulfill employment requirements when moving from Job Zone 1 through 5. On average, respondents in Job Zones 1 and 2 reported needing a reading comprehension level similar to the ability to "read step-by-step instructions" for completing a form and an active listening level similar to "taking a customer's order." For writing, on average, respondents in Job Zones 1 and 2 job reported needing a skill level akin to "taking a phone message" and a speaking level akin to "greeting tourists and explaining tourist attractions." On average, job incumbents from Job Zones 4 and 5 reported requiring more advanced capabilities for all four skills. They reported needing a reading comprehension skill level similar to "reading a memo from

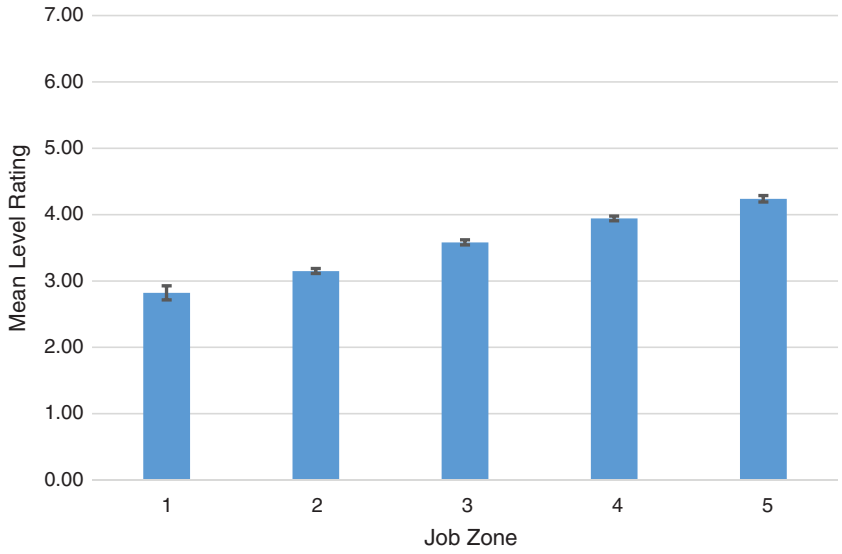

Figure 2 Knowledge of English language required for Job Zones 1–5 by level rating. The bars above the columns for each job zone show the standard errors.

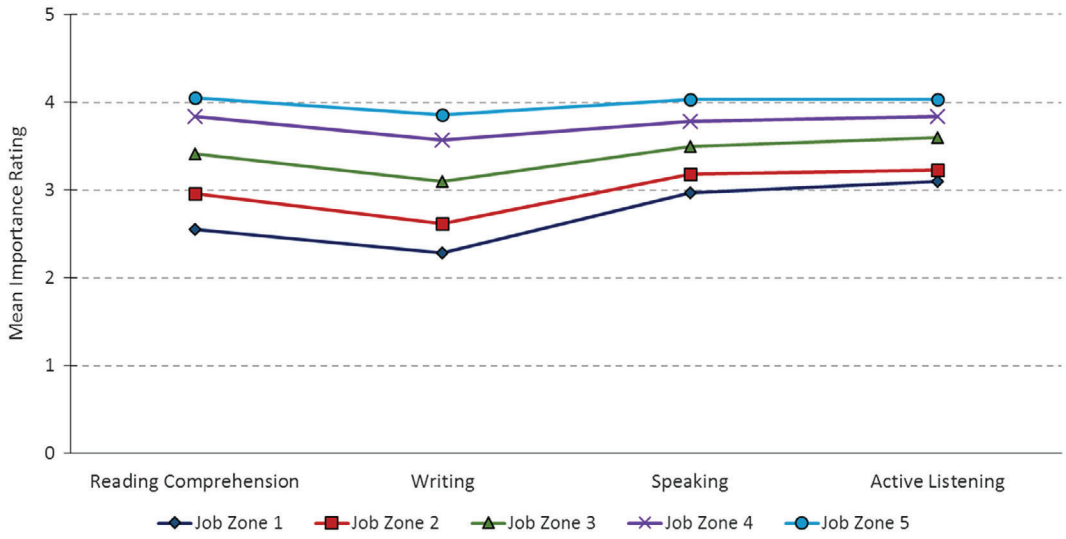

Figure 3 Communication skills required for Job Zones 1–5 by importance rating.

management describing new personnel policies" and a listening level similar to "answering inquiries regarding credit references." For writing, on average, job incumbents reported requiring a level similar to "writing to staff outlining new directives" and a speaking level akin to "interviewing applicants to obtain personal and work history."

The Abilities Questionnaire

For Job Zones 1–5, Figure 5 shows the average importance rating values endorsed for the seven communicative abilities. Across all job zones, all four speaking abilities were rated as important or very important. On average, respondents in Job Zones 1 and 2 indicated that written comprehension and written expression abilities were somewhat important and less important than the speaking abilities. On average, respondents in Job Zones 3–5 rated all four abilities as important to very important. It is interesting to note that, on average, respondents rated auditory attention as "somewhat important," a rating lower than all other skills.

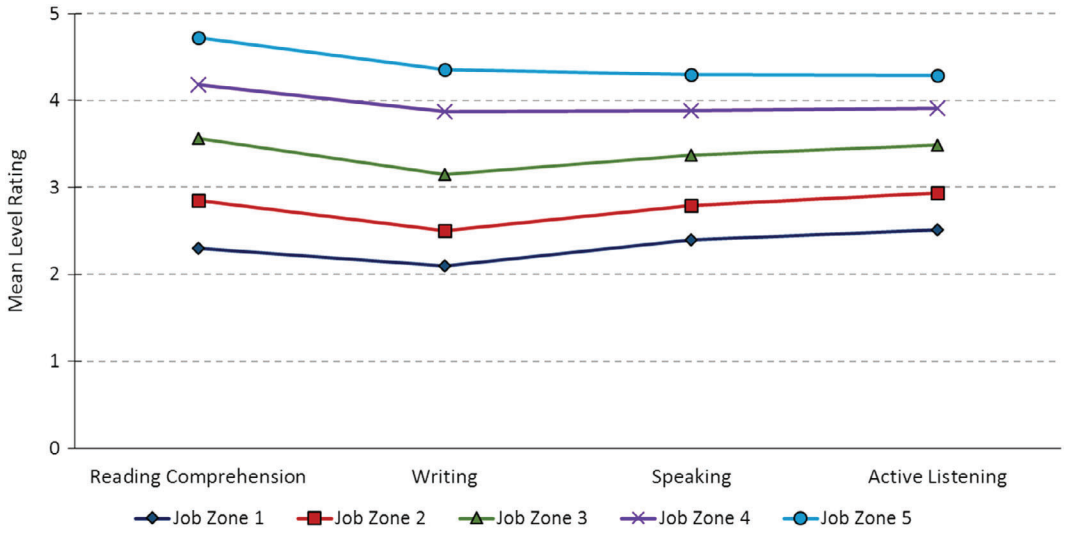

Figure 4 Communication skills required for Job Zones 1 – 5 by level rating.

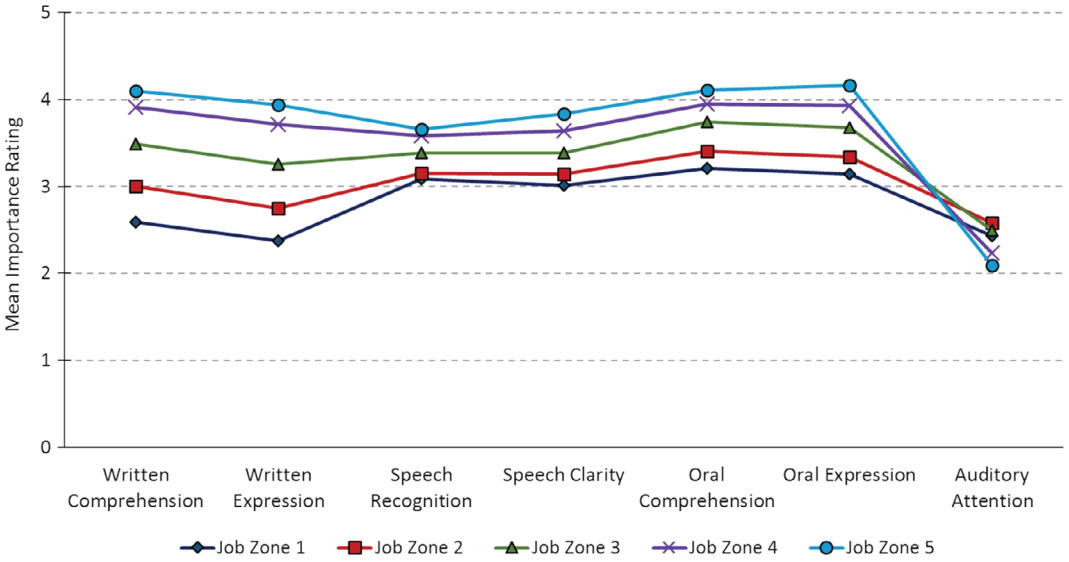

Figure 5 Communication-related abilities required for Job Zones 1 – 5 by importance rating.

Figure 6 shows that all seven abilities increased in complexity level across Job Zones 1 – 5. On average, job incumbents in Job Zones 1 and 2 rated the level of oral comprehension similar to "understanding a television commercial," speech recognition similar to "recognizing a coworker's voice," oral expression similar to "cancelling a newspaper delivery by phone," and speech clarity above the level needed to "call numbers in a bingo game" and slightly below the level needed to "make announcements over the loudspeaker at a sports event." On the other hand, on average, respondents in Job Zones 4 and 5 rated the level of oral comprehension similar to "understanding a coach's oral instructions for a sport," speech recognition similar to "identifying a former customer's voice over the telephone," oral expression above the level needed to "give instructions to a lost motorist," and speech clarity similar to "making announcements over the loudspeaker at a sports event."

In relation to writing, on average, Job Zones 1 and 2 job incumbents rated the level of written comprehension slightly above the level needed to "understand the signs on the highway" and written expression similar to the level needed to "write a note to remind someone to take food out of the freezer." In contrast, on average, Job Zones 4 and 5 job incumbents rated the level of written comprehension slightly above "understanding an apartment lease" and written expression slightly

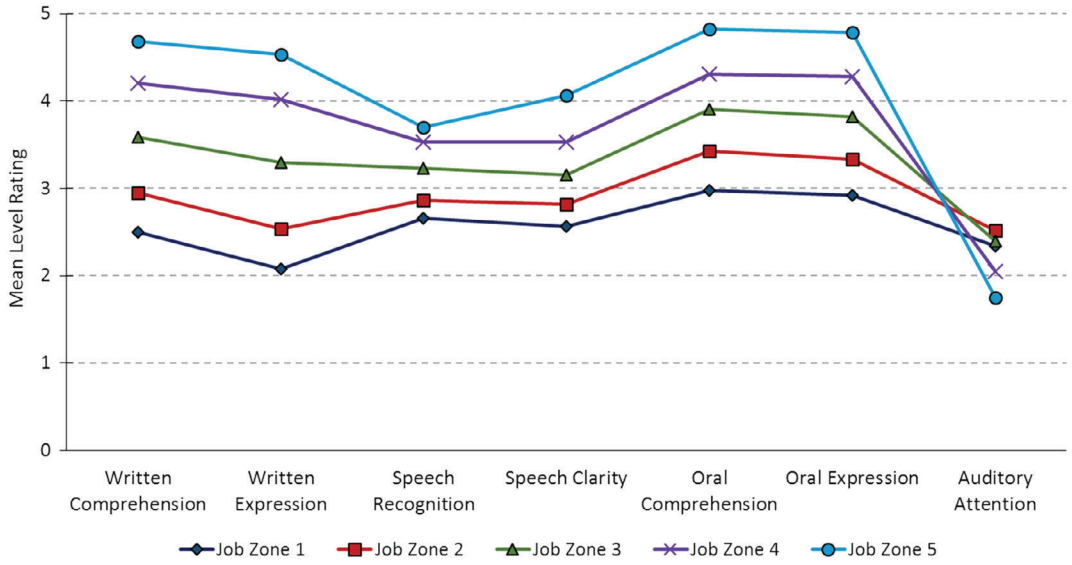

Figure 6 Communication-related abilities required for Job Zones 1 – 5 by level rating.

above "writing a job recommendation for a subordinate." For all job zones, on average, respondents indicated that the level of auditory attention needed to perform an occupation was at or slightly above the level needed to "listen to a lecture while people nearby are talking."

Significance of Differences in Mean Importance and Level Ratings Between Job Zones

Table 4 shows effect sizes related to differences in mean importance and complexity level ratings between job zones. Large effect sizes are in italics. For the most part, effect sizes were large. For instance, large effect sizes (higher than .80) were found across Job Zones 4 and 5 for all four skills (active listening, reading comprehension, speaking, and writing) in terms of how respondents endorsed complexity level and importance ratings.

Percentage Agreement of Average Importance Ratings Across Jobs and Job Zones

Table 5 shows the counts and percentages associated with the average ratings of how important raters believed communication-related knowledge, skills, and abilities were for jobs. The results are broken down by job zone. Percentages above 70% are in italics. They indicate variables believed to be important or higher than important for at least 70% of jobs. A comparison of raters' endorsements of the importance of communication-related knowledge, skills, and abilities across job zones shows that in Job Zone 1, more than 70% of raters agree that oral comprehension is important for carrying out workplace responsibilities. On average, respondents from Job Zones 2 – 5 agree that (a) active listening, (b) speaking, (c) oral expression, (d) speech clarity, and (e) speech recognition are important or higher than important for more than 70% of jobs. On average, respondents agree that knowledge of the English language, reading comprehension, written comprehension, and written expression are important or higher than important for more than 70% of jobs in Job Zones 3 – 5.

The Work Context Questionnaire

The results in Figure 7 show average ratings of respondents who endorsed Category 5 ("work context occuring on a daily basis") for Job Zones 1 – 5. The results indicate that across all job zones, job incumbents indicated that "face-to-face discussions with individuals" or "within teams" occurs frequently as compared to other communication activities, followed by "having frequent contact with others by telephone, face-to-face, or otherwise." Results also indicate differences across job zones in the types of communications that take place daily. For instance, on average, Job Zone 1 and 2 incumbents endorsed needing to "have telephone conversations" and "write e-mails" less frequently than Job Zone 4 and 5 incumbents did.

Table 4 Effect Sizes Related to Differences in Mean Importance and Level Ratings Between Job Zones

			Job zones			
Rating	Questionnaire	Variable analyzed	1 vs. 2	2 vs. 3	3 vs. 4	4 vs. 5
Importance	Skills	Active listening	0.40	*1.05*	*0.82*	*0.85*
		Reading comp.	*1.17*	*1.27*	*1.42*	*0.94*
		Speaking	0.61	*0.82*	*0.87*	*0.85*
		Writing	*0.89*	*1.23*	*1.34*	*1.01*
Level	Skills	Active listening	*1.23*	*1.35*	*1.28*	*1.25*
		Reading comp.	*1.25*	*1.60*	*1.56*	*1.39*
		Speaking	*1.03*	*1.29*	*1.42*	*1.27*
		Writing	*0.80*	*1.37*	*1.83*	*1.21*
Importance	Abilities	Auditory attention	0.31	0.18	0.64	0.40
		Oral comp.	0.53	*0.95*	0.73	0.77
		Oral expression	0.51	*0.86*	0.78	*0.87*
		Speech clarity	0.42	0.70	*0.80*	0.73
		Speech recognition	0.24	0.75	0.65	0.29
		Written comp.	*1.15*	*1.23*	*1.33*	*0.81*
		Written expression	*0.99*	*1.24*	*1.29*	*0.84*
Level	Abilities	Auditory attention	0.24	0.18	0.55	0.52
		Oral comp.	*1.17*	*1.47*	*1.37*	*1.46*
		Oral expression	*0.98*	*1.27*	*1.46*	*1.41*
		Speech clarity	0.64	*0.85*	*0.96*	*1.08*
		Speech recognition	0.53	*0.89*	0.76	0.49
		Written comp.	*1.10*	*1.61*	*1.60*	*1.27*
		Written expression	*0.89*	*1.50*	*1.71*	*1.34*

Note. Comp. = comprehension. Values between 0.2 and 0.5 indicate a small Cohen's *d* effect size, values between 0.5 and 0.8 indicate a moderate effect size, and values higher than 0.8 indicate a large effect size. Large effect sizes of 0.80 and greater are in italics.

The results also reveal the types of interactive communications that occur in the workplace. For instance, respondents from all job zones indicated needing to interact to "work with or contribute to a work or group or team," followed by interactions required to "deal with external customers or the general public" and interactions needed to "deal with coordinating or leading others in accomplishing work activities such as a leading a team of equals rather than a supervisory position." On average, the activities that received the lowest endorsements were "writing letters and memos" and "public speaking." However, it is important to note that while such activities may not be carried out daily, they may still be important.

Discussion

In this research report, we analyzed data from the O*NET database to identify the types of skills that matter to proficient workplace communication and the contexts in which language is used in the workplace (e.g., through dialogs, phone conversations, e-mails, collaboration, and teamwork). The goals are to better inform instruction and assessment of workplace English communication competencies by identifying the skills, abilities, and work contexts that represent workplace settings more authentically. These goals are consistent with previous studies advocating the need to support student learning for the workplace by providing them with opportunities to practice communication as it occurs in the workplace. As an example, a study conducted by Aull (2017), which compared two (argumentative and explanatory) genres of texts, recommended exposing students to the various genres they would see in the workplace across professional and academic arenas as a way to develop students' genre awareness and meta-language for writing according to social, cognitive, and discursive expectations in the workplace. Another study, conducted by Burstein et al. (2016), suggested that "disaggregation of information according to genre allows us to learn more about student writing in naturalistic settings (i.e., coursework in the disciplines) that is relevant to broad academic and specific disciplinary practices" (p. 118), which may lead to better training in workplace communication skills.

Our findings from the O*NET provide us with insights regarding the skills, abilities, and types of communication occurring more frequently or that are more important to fulfilling workplace responsibilities. They also serve as an initial

Table 5 Raters' Endorsement of Communication Variables as Important or Higher in Each Job Zone

		Zone 1[a]		Zone 2[b]		Zone 3[c]		Zone 4[d]		Zone 5[e]	
Questionnaire: Variable	Rating	Count	%	Count	%	Count	%	Count	%	Count	%
Knowledge: English language	3	21	52.5	157	55.5	183	72.0	126	55.3	39	24.5
	4 + 5	0	0.0	13	4.6	45	17.7	102	44.7	120	75.5
	Total	21	52.5	170	60.1	228	*89.8*	228	*100.0*	159	*100.0*
Skill: Active listening	3	26	65.0	210	74.2	207	81.5	150	65.8	42	26.4
	4 + 5	0	0.0	17	6.0	41	16.1	78	34.2	117	73.6
	Total	26	65.0	227	*80.2*	248	*97.6*	228	*100.0*	159	*100.0*
Skill: Reading comprehension	3	4	10.0	154	54.4	214	84.3	150	65.8	33	20.8
	4 + 5	0	0.0	1	0.4	18	7.1	77	33.8	126	79.2
	Total	4	10.0	155	54.8	232	*91.3*	227	*99.6*	159	*100.0*
Skill: Speaking	3	22	55.0	191	67.5	195	76.8	152	66.7	49	30.8
	4 + 5	0	0.0	18	6.4	45	17.7	76	33.3	110	69.2
	Total	22	55.0	209	*73.9*	240	*94.5*	228	*100.0*	159	*100.0*
Skill: Writing	3	0	0.0	66	23.3	168	66.1	206	90.4	79	49.7
	4 + 5	0	0.0	1	0.4	2	0.8	18	7.9	80	50.3
	Total	0	0.0	67	23.7	170	66.9	224	*98.2*	159	*100.0*
Ability: Oral comprehension	3	29	72.5	227	80.2	149	58.7	84	36.8	17	10.7
	4 + 5	1	2.5	34	12.0	103	40.6	144	63.2	142	89.3
	Total	30	*75.0*	261	*92.2*	252	*99.2*	228	*100.0*	159	*100.0*
Ability: Oral expression	3	26	65.0	210	74.2	166	65.4	100	43.9	18	11.3
	4 + 5	1	2.5	34	12.0	87	34.3	128	56.1	141	88.7
	Total	27	67.5	244	*86.2*	253	*99.6*	228	*100.0*	159	*100.0*
Ability: Speech clarity	3	21	52.5	196	69.3	220	86.6	194	85.1	98	61.6
	4 + 5	0	0.0	9	3.2	14	5.5	32	14.0	60	37.7
	Total	21	52.5	205	*72.4*	234	*92.1*	226	*99.1*	158	*99.4*
Ability: Speech recognition	3	26	65.0	219	77.4	239	94.1	206	90.4	143	89.9
	4 + 5	0	0.0	3	1.1	7	2.8	21	9.2	16	10.1
	Total	26	65.0	222	*78.4*	246	*96.9*	227	*99.6*	159	*100.0*
Ability: Written comprehension	3	5	12.5	165	58.3	194	76.4	94	41.2	22	13.8
	4 + 5	0	0.0	6	2.1	35	13.8	133	58.3	137	86.2
	Total	5	12.5	171	60.4	229	*90.2*	227	*99.6*	159	*100.0*
Ability: Written expression	3	2	5.0	86	30.4	184	72.4	175	76.8	53	33.3
	4 + 5	0	0.0	1	0.4	9	3.5	51	22.4	106	66.7
	Total	2	5.0	87	30.7	193	*76.0*	226	*99.1*	159	*100.0*

Note. Rating 3 = important, 4 = very important, 5 = extremely important. Percentages above 70% are highlighted in italics to indicate the variables that raters believed were important for at least 70% of jobs.

[a] $n = 40$. [b] $n = 283$. [c] $n = 254$. [d] $n = 228$. [e] $n = 159$.

step to identifying the communications that are relevant to the workplace as well as the modalities and settings in which such communications are carried out.

The first question we examined sought to identify the skills and abilities that are more important in the workplace. Generally, our analyses reveal that most communication skills are integral across job zones, that there is a general upward trend in the need for communication as we move across job zone levels, and that all four communication skills (i.e., reading, writing, listening, and speaking) are needed for the workplace, particularly in Job Zones 4 and 5. The need for all four communication skills (reading, writing, listening, and speaking) is consistent with previous research (Powers, 2010; Powers & Powers, 2015). For instance, Powers and Powers pointed out that even in instances when test scores on oral presentations are used to make decisions regarding candidate selection, giving successful oral presentations does not rely on verbal communication alone. Other communication skills, such as reading and writing notes to summarize information, are required to appropriately prepare for the presentation. Additionally, it requires interactive communication between the presenter and the audience to respond to questions from the audience. Consequently, the exclusion of some communicative skills from learning and instruction may lead to construct underrepresentation and underpreparation. Additionally, considering only a single or fewer than four skills may provide an imprecise estimate of a person's ability to communicate in English and lead to training learners on a narrow skill set. The notion of a narrow focus on skills training on teaching and instruction was raised by Messick (1996). He discussed the impact of testing on teachers, stating that tests

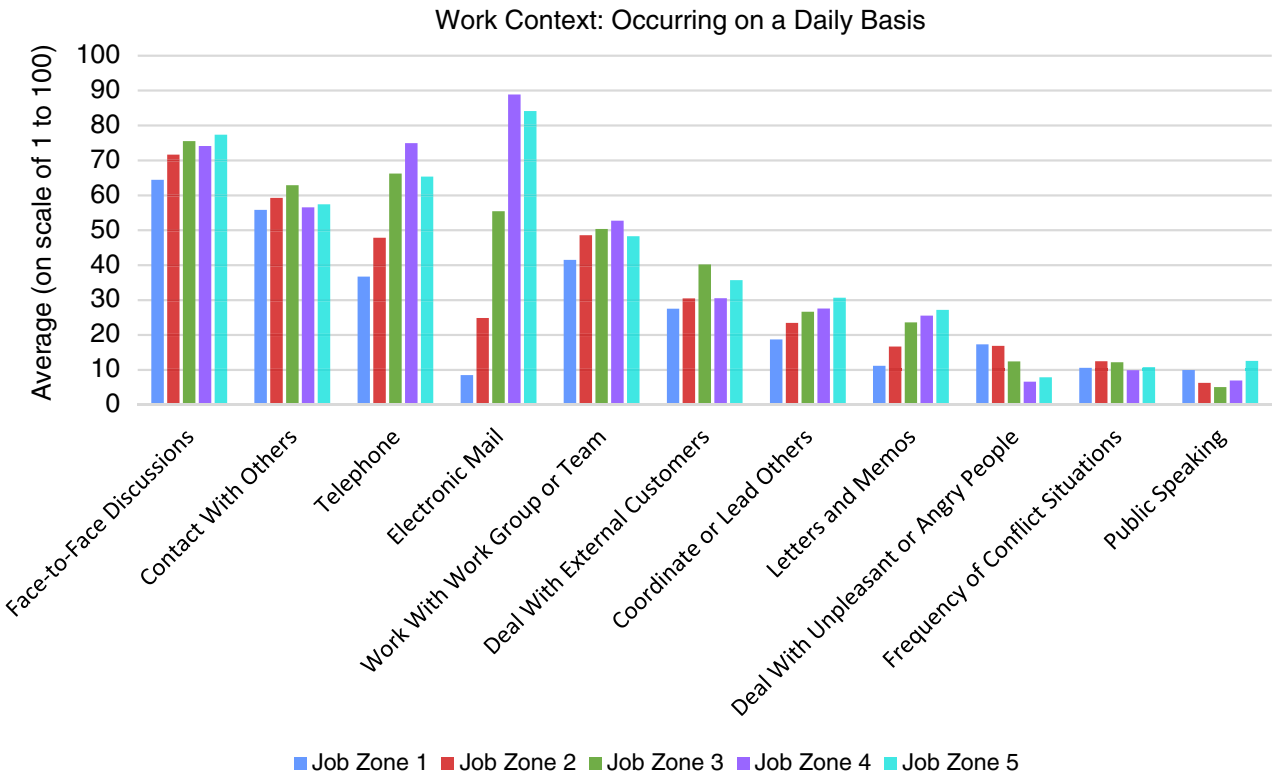

Figure 7 Average endorsement of work context activities occurring daily for Job Zones 1 – 5.

influence not only test content (a narrow vs. a comprehensive set of skills) but also the modality of test administration (skills in isolation vs. interactive skills).

Our findings also reveal insights regarding task level complexity of reading, writing, listening, and speaking needed for carrying out various functions across job zones. The scales provided by O*NET may be useful in conceptualizing tasks at different levels of complexity. Such information may be used to set instructional benchmarks and assessments that are more closely aligned with the knowledge, skills, and abilities required to fulfill jobs successfully. Although this information may be useful, one limitation of the O*NET was that it only provides three task examples for each questionnaire. Thus one suggestion for O*NET developers is to provide additional descriptors at each scale point in future development efforts. The additional descriptors could be helpful to inform instruction and assessment at more fine-grained levels.

Our second question aimed to identify the types of social interactions and communicative activities that occur more frequently at work. Our findings reveal that communication often happens interactively. The implications for instruction are to include opportunities for interactive communication (e.g., dialogs, conversations, or collaborative work) to improve employee training. Gilmore (2004) and Usó-Juan and Ruiz-Madrid (2007) described the underrepresentation of interactive communications at work and suggested developing contextualized learning materials to facilitate the learning of pragmatics and the appropriate language to use with diverse audiences. Such instructional materials and assessments would help to narrow the disjuncture between the skills obtained in the academic context and the skills needed in the workplace and would provide individuals with opportunities to improve their work-related communication skills.

Beyond this limitation from the O*NET, we also suggest that our findings may have limitations and require further research to provide more descriptive information regarding how particular tasks may be carried out in the workplace. Such research may be supplemented with research from other lines of investigation, such as discourse and corpus analysis, to better capture the nuances of workplace communication to inform instruction and the development of assessment tasks. We note that the importance and complexity levels of the knowledge, skills, and abilities described in the article were reported from the perspective of job incumbents and not from the perspective of human resource managers or individuals with hiring responsibilities. Oliveri and Tannenbaum (2017) provided a description of the skills needed by human resource managers from various countries. It is of interest to note that there are similarities between the skills reported by the

two groups, as both groups reported interactive communication, collaboration, and teamwork to be important for the workplace. Future research is needed, however, to more systematically analyze which skills are similar and which ones are different when comparing the perspectives of managers and employees.

To conclude, we point out that our analyses help address a gap in the literature because there has been an emphasis on the academic aspects of English rather than workplace aspects. The workplace context is important, as it tends to be more heterogeneous than the academic one. Relevant workplace skills also include interactive communications among a larger number of people, collaborations across organizational units within a company, and the accomplishment of a larger number of activities than in the academic domain; employee preparation would thus need to reflect such complexities to inform meaningful inferences about the workplace context in support of improved training in workplace communication skills.

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