

## **Guidelines for Education and Training in Industrial-Organizational Psychology**

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Society for Industrial and Organizational Psychology, Inc.

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These Guidelines represent the views and expertise of the Society for Industrial and Organizational Psychology (SIOP), Inc., Division 14 of the American Psychological Association (APA) and Organizational Affiliate of the Association for Psychological Science (APS). In issuing these Guidelines, SIOP is not speaking for APA, APS, or any other division or unit of APA or APS.

### **Section A. Introduction**

#### **Purpose of the Guidelines**

These guidelines replace earlier versions published in 1985 and 1999 by SIOP (Division 14 of the American Psychological Association). These guidelines have been written to aid faculty and curriculum planners in the design of master's- and doctoral-level graduate programs in Industrial-Organizational (I-O) Psychology. They may also be useful to potential master's and doctoral students in the discipline by providing a preview of training, suggesting criteria that may be used to select a graduate program, and giving students an overview of the competencies they are responsible for mastering during the course of their graduate education.

The term "guidelines" refers to pronouncements, statements, or declarations that suggest or recommend specific professional behavior, endeavors, or conduct for psychologists (APA, 2004). Guidelines differ from "standards" in that "standards" may be mandatory and may be accompanied by an enforcement mechanism. Thus, as guidelines, the contents of this document are not intended to be mandatory, exhaustive, or a substitute for appropriate professional judgment and they may not always be applicable in all situations. The aspirational intent of the guidelines is to facilitate the continued development of I-O Psychology.

Although such guidelines have implications for several other related concerns of SIOP members, these other concerns will not be addressed here. Specifically, these guidelines were not written for the purpose of providing the basis for graduate studies program certification, determining eligibility for specialty licensing as an I-O psychologist, establishing eligibility for membership in SIOP, or highlighting the continuing education and training needs of the profession. Finally, it should be reiterated that the focus of this document is education and training in I-O psychology. These guidelines are not designed to be a set of recommendations for education in related fields (e.g., Labor and Industrial Relations, Human Resources, Organizational Behavior). Although it is recognized that a large number of academic disciplines or specialties are concerned with developing related subject matter and skills, these related areas are beyond the scope of these guidelines.

These guidelines were developed by a subcommittee of the Education and Training Committee guided by SIOP membership at large and approved by SIOP's Executive Board. The committee started with the most recent versions of the guidelines, reviewed the content for relevance, consulted various sources, and made recommendations for

revisions. In addition, the document was revised to be consistent with APA's guidelines on education guidelines (APA, 2004). Finally, due to the lack of empirical evidence to support separate sets of competencies for the master's and doctoral levels (Payne, Botsford Morgan, & Allen, 2015), one set of guidelines was developed. However, we continue to acknowledge the following distinctions between master's- and doctoral-level education. Most of these distinctions assume earning a master's degree in a terminal master's program, rather than earning a master's degree on the way to the doctorate.

### **Distinctions between Master's and Doctoral Level Education**

**Breadth and Depth of Training.** Master's-level students will typically receive a narrower breadth of training compared to doctoral students. This stems largely from the fact that fewer credit hours are required for the master's degree. Thus, the competencies listed in Table I may not be covered as fully at the master's level as they might be at the doctoral level. As a result, there may be considerable variability in program content among master's level I-O programs (e.g., one program may emphasize organizational issues, while another emphasizes industrial issues). Tett, Walser, Brown, Simonet, and Tonidandel (2013) provide evidence of the variability of master's-level I-O programs.

Master's students are expected to demonstrate basic-level competencies and to be exposed to higher-level concepts. For example, whereas a doctoral student may take several courses in statistical analysis, the master's student may have just one or two courses. Besides fewer credit hours, master's education is typically delivered with a larger student-to-faculty ratio than is true of doctoral-level training (Lowe, 1993; Tett et al., 2013). This type of training is consistent with the generalization that master's-level students will typically be consumers of I-O knowledge, rather than producers of new knowledge. As such, they are engaged in applying this knowledge to issues involving individuals and groups in organizational settings. Those involved in research usually do so under the guidance of a doctoral-level psychologist.

As a result of the breadth and depth differences in training, it is expected that compared to a master's student, a doctoral student would have a higher level of proficiency in the areas of competence listed. In the future, it may be useful to differentiate various levels of proficiency for each competency.

**Career Options.** The career options are different for master's-level versus doctoral-level graduates. Schippmann, Schmitt, and Hawthorne (1992) reviewed the work roles of I-O students whose terminal degree is the master's degree versus the Ph.D. They concluded that there are substantive differences between the kinds of work performed by these two groups. There were very few master's graduates in academic roles, whereas master's graduates were more highly represented in jobs such as compensation, training, data analysis, and generalist human resource management compared with doctoral graduates. More current data can be found in SIOP's salary surveys (e.g., Khanna, Medsker, & Ginter, 2013) and Career Study (Zelin, Lider, & Doverspike, 2015).

**Further Education.** Some master's-level students are interested in continuing to doctoral study and these guidelines identify the topic areas on which such students are likely to delve deeper during that transition. Master's programs may be designed to serve students who want (1) pre-doctoral training, (2) practitioner-oriented training (i.e., a terminal master's degree), or (3) both. It is likely that research skills will be weighted more heavily in pre-doctoral training programs than terminal master's degree programs. Pre-doctoral programs would also be appropriate for master's-level I-O practitioners who work in research settings. Terminal master's programs may opt to place greater weight on content and practical application issues relative to research skills.

These and other distinctions between master's-level and doctoral-level training might lead to substantial differences in the two levels of training. However, none of the differences highlighted above suggests that the basic content of the field changes as a function of the level of education. Thus, only one set of competencies is provided within these guidelines. The perspective of these guidelines is that the competencies identified in Table 1 are ideals that no program is likely to meet completely. They are provided to aid faculty and curriculum planners as they start new programs or try to improve their current programs.

**Title.** The titles held by master's-level and doctoral-level graduates sometimes differ, in part because most master's-level graduates work in applied settings (Ekeberg, Switzer, & Siegfried, 1991; Schippmann et al., 1992). For example, it is inappropriate to use the term "psychologist" for master's-level-educated individuals, because the use of that term is regulated by law in some states, and is usually restricted to persons who have completed doctoral

training and/or have been licensed. For simplicity, however, the title “I-O psychologist” is used throughout this document.

## **Section B. Implementation and Maintenance of Proposed Standards and Guidelines**

The Educational and Training Committee is responsible for the development, dissemination, endorsement, approval, and maintenance of the guidelines. Guidelines will be made readily available to the SIOP membership and the public via the SIOP website. Consistent with APA’s document on the development of educational guidelines and standards (APA, 2004), the guidelines will be updated and reviewed for reaffirmation by the APA in accordance with Association Rule 30-8.3 within ten years from the time of their approval.

## **Section C: Content of the Proposed Standards and Guidelines**

### **Perspective of the Guidelines**

In many respects, the perspective taken in the current guidelines is consistent with that expressed in the earlier versions. Like the 1999 versions, this revision adheres to the scientist-practitioner model and takes a competency-based approach.

***The scientist-practitioner.*** Consistent with the traditional orientation and philosophy of the members of SIOP, the underlying theme embedded in these training guidelines is that I-O psychologists are frequently both the generators of knowledge and the consumers/users of such knowledge. As scientists, they develop and evaluate theory using research and empirical skills. As practitioners, they apply and evaluate theory and research under specific conditions. Thus, I-O psychologists frequently provide psychological services to individuals and groups in organizational settings.

Taking the scientist-practitioner model seriously means that master’s and doctoral education each need to focus on both the theory and application associated with all content areas. We recommend that both theory and practice receive consideration as students learn about the content of I-O psychology. The relevance of theory to practice and to applied research should be emphasized. I-O practitioners working in the field can facilitate the development of master’s and doctoral students' practical knowledge by offering internship and research opportunities and by sharing their own practical experiences.

***Careers.*** This dual emphasis on theory and practice is needed regardless of a student's intended career path. Those interested in academic careers need to understand both theory and practice to develop sound research, the findings of which should have a meaningful applied impact. Academicians will also be charged with teaching new generations of I-O psychologists about the theory and applications associated with each content area. I-O practitioners in industry, government, and consulting are required to use their knowledge and skills to deliver products. Thus, students not only need to know each topic in a theoretical sense; they also need to know "how to" develop and implement associated products. For instance, a student should know "how to" design and conduct a job analysis or conduct and report on the results of a test validation. Learning about a topic in a theoretical sense is not equivalent to the experience of applying that information. Doing it and having first-hand familiarity with the pitfalls, limits, and constraints of a technique is different from, and as critical as, theoretical knowledge.

In 2013-2014, SIOP’s Professional Practice Committee embarked on a project called the “Career Study” with the objective of developing a further understanding of how the careers of I-O psychologists develop over time (Zelin, Doverspike, Oliver, Kantrowitz, & Trusty, 2014). Extensive data were collected and have been summarized in a series of *The Industrial-Organizational Psychologist (TIP)* articles (Zelin, Oliver, Chau, Bynum, Carter, Poteet, & Doverspike, 2015a, 2015b, 2015c, 2015d) and in a comprehensive report (Zelin et al., 2015). Within these reports, the most-important competencies and critical experiences are presented for the four employment sectors in which I-O psychologists primarily work: academia, consulting, industry, and government. Data are also presented by the various levels at which I-O psychologists work: individual contributor, expert individual contributor, manager, manager of managers, and executive. The competencies in the Career Study extend beyond the knowledge domains listed in these guidelines. Across all four employment sectors, *oral communication* and *ethical behavior* were listed as two of the top five competencies, regardless of level. Many of the respondents in individual-contributor positions

indicated they learned hard (as opposed to soft) skills, such as written communication skills, in graduate school. The same respondents also indicated that these skills were needed for success in lower levels positions and in the early stages of their career. The top competencies for each employment sector and where those competencies were learned are identified within these reports. For example, the top five competencies for consulting were oral communication, ethical behavior, critical thinking, integrity, and trustworthiness. Respondents working in consulting indicated they learned the following highly rated competencies in graduate school: knowledge of multiple content areas in psychology, data analysis, critical thinking, knowledge of test development, knowledge of validation principles, research skills, and psychometrics. They also indicated they learned the following highly rated competencies on the job: business development, coaching, creating a vision, customer service, decision-making, delegation, political savvy, and product knowledge. Correspondingly, this information was incorporated into the first competency.

**Competencies.** As emphasized in previous Guidelines, the goal of graduate training is developing competencies. Taking a competency-based approach, these guidelines focus on the skills, behaviors, and capabilities necessary to function as a new member of the profession. One of the committee's primary goals was to update the competency list to reflect current content thought to be important for I-O psychologists.

The description of each competency area was amended as needed to reflect the current state of the discipline. In some cases competency titles were altered or reorganized to reflect new content and more-appropriate groupings within a domain. Consistent with the emphasis on the scientist-practitioner model, every opportunity to emphasize both theory and practice related to a competency has been seized in this revision of the guidelines.

Just as both science and practice are inherent in each competency, we also feel that an appreciation of diversity and well-being can be applied to each area. Graduate training in I-O psychology should take every opportunity to emphasize working with all types of people, developing both an appreciation of diverse views and the well-being of others.

**Identifying competencies.** A number of sources were consulted in updating the content of existing competency areas and developing new ones. We started with the 1999 versions of the master's and doctoral guidelines, only departing from them as deemed necessary. Several discussions of the education and training of I-O psychologists in *TIP* (e.g., Chorbos-Mason & Ferdman, 2001; Handler, 2014; Silzer, Erickson, Robinson, & Cober, 2008; Tett, Walser, Brown, Simonet, & Tonidandel, 2013) and in *Industrial and Organizational Psychology: Perspectives on Science and Practice* (e.g., Byrne, Hayes, McPhail, Hakel, Cortina, & McHenry, 2014; Zelin, Lider, Doverspike, Oliver, & Trusty, 2014) were consulted. Various other sources supplied a sense of where we have been and where we are going as a discipline (e.g., Aguinis, Bradley, & Brodersen, 2014; Ryan, 2003), workplace trends (Below, 2014), skills needed to be successful (e.g., Hedge & Borman, 2008), and recent I-O Psychology handbooks (e.g., Kozlowski, 2012). A survey of graduate-program directors in the summer of 2015 also provided ratings of the competencies included in the 1999 versions of the Guidelines for both a master's degree and a doctoral degree (Payne et al., 2015). Survey respondents were also given the opportunity to comment on proposed revisions of the competency descriptions and to comment on issues related to updating the Guidelines. Finally, numerous I-O psychologists in academia, industry, consulting, and the government provided input, as did students at various stages of graduate training.

**Related competencies.** The bulk of this document describes the areas or domains recommended specifically for training in I-O psychology. However, before presenting them, it would be useful to comment on domains considered but judged not to be appropriate as part of this document.

One cluster of competencies that remains omitted involves areas in which it would be desirable but not necessary to have training to ensure career success in I-O psychology. A list of these areas could easily be expanded to include much of social science and business (e.g., content mastery in Compensation, Economics, Marketing, Labor Relations, and Accounting). Potential important process capabilities (skills) would include those needed for organizational development efforts, employee counseling, or individual rehabilitation. Competencies in all these areas would indeed be appropriate and desirable, but they are not made parts of these guidelines.

Other aspects of graduate training have not been formally incorporated into these guidelines. Any quality graduate program should provide students with a realistic preview particular to that program. Expectations and requirements should be clear and explicit from the outset, beginning with the recruiting process. If a program has a particular

emphasis (e.g., training academicians or training practitioners), it is also reasonable to expect that emphasis to be clearly communicated. Although these are things that we encourage graduate programs to do, we have not developed specific guidelines for them.

Ideally, a good graduate program provides guidance to students in their own career planning and in the use of career-enhancement strategies (e.g., interviewing skills). Such activities assist a student in drawing together personal information and experiences in a formal effort to make a career decision and to map out a suitable career path. Once a decision has been made, appropriate developmental experiences could then be provided in a systematic way. Many schools already incorporate such planning, often using a variety of mechanisms (e.g., assigning an advisor, establishing a guidance committee). Although this is viewed as a desirable feature of a graduate program, it is not expressed as a competency.

Finally, if a primary aim of graduate education is to produce responsible professionals, it seems reasonable that this notion be reinforced throughout graduate training. Helping students understand the ways in which they are responsible for their own education and career development is highly appropriate and desirable. Though we believe that taking responsibility for one's own professional development should be emphasized (e.g., developing a professional network, communicating with peers, participating in the field), a relevant competency has not been formally articulated.

**The recommended domains.** Table 1 lists the areas identified by the committee as relevant to the training of I-O psychologists at the graduate level. The competencies were organized into three groups. The first (competencies 1-6) reflects the more-general knowledge and skill areas deemed appropriate in the training of I-O psychologists. The second group (competencies 7-24) contains those competencies that reflect core content in the field of I-O psychology. The third group (competencies 25-26) contains related competencies for consideration. The entries are presented alphabetically within their group. The presentation order of the three groupings should not be construed to reflect importance or priority in training; however, ratings of importance by degree are available in Payne et al. (2015).

In describing the knowledge and skills to be developed, the committee endeavored to stay at the appropriate level of specificity. Our goal was to highlight the key components of each domain well enough to be of help to curriculum designers. We do not describe the totality of the domain. It is also clear that domains are not always easily differentiated. In some cases it may be argued that (analytically/taxonomically) one area could be subsumed within another. Similarly, it is clear that competencies in one domain facilitate mastery or performance in another. These points notwithstanding, we felt that all of the areas listed in Table 1 were sufficiently discrete and important to warrant their separate places on the list.

The presentation of the domain attempts both to define and to suggest ways to measure or to index achievement. That is, there is frequent reference to indicators or possible ways that skills in a domain are manifested. Many of these might be used by educators to decide whether or not a person is indeed proficient in an area. This is not to imply that those that are presented are the only indicators of proficiency.

## **Recommended Areas of Competence**

Table 1 lists the areas recommended by these guidelines for inclusion in graduate-level programs in I-O psychology. The majority of these competencies were included in the 1999 version of the Guidelines. The description of each competency area was updated as appropriate. In some cases competency titles were altered to reflect the latest terms used (e.g., “Job/Task Analysis and Classification” was changed to “Job/Task/Work Analysis/Competency Modeling and Classification”) or to broaden the domain (e.g., “Consulting and Business Skills” was changed to “Professional Skills”). Each competency area is described below:

### **GENERAL KNOWLEDGE AND SKILLS**

#### **1. Ethical, Legal, Diversity, and International Issues**

This domain has to do with the various contexts within which the I-O psychologist operates. I-O psychologists should have knowledge of and should behave in accord with relevant ethical guidelines when consulting as well as conducting research (e.g., [Ethical Principles of Psychologists and Code of Conduct](#), 2002, Amended 2010, and the

*Ethical Principles in the Conduct of Research with Human Participants*, 1973, 1982). I-O psychologists should maintain integrity at all times and across situations

I-O psychologists should also have knowledge of relevant federal, state, and local laws, statutes, regulations, and legal precedents (e.g., the Equal Employment Opportunity Commission's *Guidelines on Employee Selection Procedures*). Since a fair amount of professional work done in organizations is covered by negotiated labor contracts, competency in this domain would also include an awareness of opportunities and restrictions imposed by such agreements, as well as an appreciation of the labor/management dynamics associated with them. All I-O psychologists should have knowledge of the various and the latest professional norms, standards, and guidelines relevant to their profession (e.g., *Standards for Providers of Psychological Services*, 1979; [Principles for the Validation and Use of Personnel Selection Procedures, 2003](#); *Standards for Educational and Psychological Testing*, 2014).

I-O psychologists should be sensitive to and have the interpersonal skills to interface with a diverse audience in a multicultural, global environment (e.g., *Guidelines on Multicultural Education, Training, Research, Practice, and Organizational Change for Psychologists*, 2002). I-O psychologists are concerned about the well-being of individuals, human rights, and working conditions for individuals worldwide as reflected by SIOP's prosocial agenda, NGO with consultative status to the United Nations (ECOSOC) and an official United Nation's Global Compact participant.

## **2. Fields of Psychology**

I-O psychology is the scientific study of working and the application of that science to workplace issues facing individuals, teams, and organizations. I-O psychology is a context-centered discipline. This focus differentiates it from fields of psychology that study basic processes (e.g., perception, memory, learning), from fields that study particular populations of individuals (e.g., children, the mentally ill), and from fields that study mechanisms of behavior (e.g., physiological psychology, brain research). Although the populations of individuals and the locations are diverse, we are eclectic. Because we borrow ideas, procedures, and paradigms from the other fields of psychology, it is important that we have an understanding of the strengths, weaknesses, and sources of our borrowings.

While we draw freely from other fields of psychology, we may not borrow equally from all fields. We share a great deal with social psychology, psychometrics, motivation, learning, and personality. Historically, the discipline has borrowed less heavily from clinical and developmental psychology. The importance of these fields of psychology to the I-O area changes over time and obviously varies with the particular interests of the individual I-O psychologist. It is difficult to predict which of the related fields will develop research leads and findings in the near and distant future that will have an impact on I-O psychology. In any event, to be consistent with APA recommendations (American Psychological Association Committee on Accreditation, 2013), exposure should reflect competency in the following broad areas: biological aspects of behavior, cognitive and affective aspects of behavior, and social aspects of behavior.

Students in graduate programs in I-O psychology should be able to read and to comprehend the issues and controversies involved in basic research published in journals in at least a subset of these related areas. The specific fields of competency and journals read will vary among individuals, but I-O psychologists should be able to understand historical and new developments in other areas of psychology that impact their areas of research and practice.

## **3. History and Systems of Psychology**

If I-O-psychology graduate students know how the discipline of psychology developed and evolved into its present configuration, then each generation will share the common bonds and language of the discipline. They will also possess knowledge of the intellectual heritage of our field. Such common knowledge is important for the pragmatic functional role it plays in communication and in preventing frequent repetitions of the mistakes and dead ends of the past. Many historical schools and systems of psychology have contemporary representatives, either in a pure or a diluted form; knowledge of the roots of these different theoretical positions is important. For example, many contemporary debates about theoretical perspectives appear dysfunctional when viewed against the background of historical developments in our field. Knowledge of our history enables us to appreciate these different approaches

both for their unique contributions to psychology and for the alternatives they provide for an understanding of observable phenomena.

An understanding of history and systems of psychology allows integration of I-O psychology into the broader discipline by tracing our roots back to American functionalism, radical behaviorism, views of Freud, Titchener, Tolman, Spearman, and Cattell and other perspectives that have shaped the thinking of psychology. Such integration is important to foster an attitude among I-O psychologists that places high value on the development of theoretical approaches to the I-O psychology problems that are well integrated with psychology as a whole. In addition, there is the specific history of the field of I-O psychology to consider. Understanding one's roots as an I-O psychologist and our more recent past is essential.

#### **4. Professional Skills (Communication, Business/Research Proposal Development, Consulting, & Project-Management Skills)**

In all employment sectors, success as an I-O psychologist requires the development of a variety of professional skills. Communication, business development, and project management represent broad categories capturing some of the most-essential professional skills.

Effective communication is critical and required to interact with and to influence others regardless of the context. Communication skills encompass using technology, writing, and presenting. They also involve interpersonal, negotiation, and conflict-management skills in order to build and maintain relationships and an ability to navigate relationships in a politically savvy way. Communication skills are particularly important in team contexts. An understanding of how individual efforts facilitate group performance and the ability to contribute as a member of a group are essential. I-O psychologists must be able to effectively translate scientific research to professional and layperson audiences.

Business writing is characterized by brevity, action orientation, attention to the audience, and link to the organization's bottom line. Business presentation involves the development and delivery of information to a professional audience that clearly articulates key messages in terms that the audience can understand, along with skills in responding to questions. Academic writing involves summarizing theory, previous research, study design and procedures, statistical results, conclusions, and theoretical and applied implications.

Effective business and research proposal development depend on the ability to create a vision and package ideas and requests in a fashion that leads to their acceptance, which results in securing funds and support to provide services or to conduct studies. Many good ideas are rejected because they are poorly communicated or inadequately justified in terms of their benefits. A practical problem-solving approach is frequently required in a business or consulting setting. Relevant content and methodological skill or knowledge, regardless of its source or discipline, along with creative "outside-the-box" thinking, is often required to address and solve practical business problems. This involves understanding how elements relate to a larger whole (e.g., the effect of a change in compensation on employee productivity, satisfaction, and turnover).

Effective consulting encompasses problem-solving and decision-making skills, communicating solutions in layperson's terms, selling products and services, developing and maintaining relationships with clients, and providing high quality customer service.

Project-management skills focus on the details of organizing work. This may include budgeting, scheduling, delegating, and managing/coaching others so that work is accomplished in an efficient and effective manner. Project management often requires the integration and utilization of information from several sources. Success is contingent upon being able to attend to detail while maintaining a view of the "big picture."

#### **5. Research Methods**

I-O psychologists apply the scientific method to investigate issues of critical relevance to individuals, businesses, and society. The research-methods domain includes the procedures, techniques, and tools useful in the conduct of empirical investigations of phenomena of interest in I-O psychology. The specific areas encompassed by research methods include the scientific method (with attention to issues in the philosophy of science); inductive and deductive reasoning, the generation and articulation of problem statements, research questions, and hypotheses;

literature review and critique; the nature and definition of constructs; study designs (experimental, quasi-experimental, and non-experimental); and psychometrics.

At an operational level, research methods includes, but is not limited to, the manipulation of variables (in experimental research), the concepts underlying and methods used for the assessment of the reliability and validity of measures, the administration of various measures (questionnaires, interviews, observations of behavior, projective measures, etc.), the use of various sampling procedures (probability- and non-probability-based) especially as applied to survey research, the conduct of research in the laboratory and the field with various strategies (experiment, survey, simulation, case study, etc.), the use of statistical methods to establish relationships between variables, causality, and the formulation of research-based conclusions. Specific knowledge about relative strengths and weaknesses of different research strategies, an understanding of qualitative research methods, and an appreciation of the benefits of alternative strategies must be developed. Information-technology-related skills remain important for gathering and analyzing data and specific technology-related skills (e.g., programming) may be particularly useful. Finally, an understanding of the ethical standards that govern the conduct of all research involving human participants is essential. A solid foundation of knowledge in research methods will ensure that I-O psychologists are savvy consumers and producers of I-O psychological research.

### **6. Statistical Methods/Data Analysis**

This domain has to do with the various statistical techniques that are used in the analysis of data generated by empirical research. The domain includes both descriptive and inferential statistical methods, spans both parametric and nonparametric statistical methods, and includes both quantitative and qualitative research methods and data analysis. Among the specific topics included in the domain are: estimates of central tendency, estimates of variability, sampling distributions, point and interval estimates, inferences about differences between means and proportions, univariate and multivariate analyses of variance (fixed, random, and mixed effects models), and linear and non-linear regression and correlation. Some more-advanced statistical techniques include but are not limited to path analysis, multiple-discriminant function analysis, multiple and canonical regression, factor analysis, components analysis, cluster analysis, pattern analysis, structural-equation modeling, multilevel modeling, latent growth modeling, dyadic/social-network analysis, and meta-analysis.

Knowledge of this domain implies a basic understanding of the statistical foundation of such methods, asymptotic sampling variances of different statistics, the assumptions underlying the proper use of the same methods, and the generalizations, inferences, and interpretations that can legitimately be made on the basis of statistical evidence. It is also important to be able to translate research findings into theoretical and applied implications in layperson terms. Students should be skilled in using at least one of the major statistical software packages designed for social science research.

## **CORE CONTENT**

### **7. Attitude Theory, Measurement, and Change**

Attitudes, opinions, and beliefs are important for quality of work life, for diagnosing problems in organizations, and in regards to their relation to behavioral intentions and behaviors at work. Some of the job attitudes typically studied by I-O psychologists include, but are not limited to, engagement, job satisfaction (general and facets), job involvement, organizational commitment, and perceptions of support and fairness.

I-O psychologists should also be aware of the extensive literature on attitude theory, measurement, and change. In particular, I-O psychologists must know how attitudes are formed and changed and how they relate to behaviors. With respect to the latter, knowledge of the literature on the relationship between attitudes and behavior is important if for no other reason than to know the limitations of the connections between these two sets of constructs.

### **8. Career Development**

Theory and research regarding career development are concerned with the interplay between individuals and environments and attempt to describe the nature of the patterns of positions held and resultant experiences during an individual's lifespan. Included in this domain are models and explanations of the origin and measurement of individual aptitudes and vocational interests; how individual, social, environmental, and chance factors shape educational and training experiences; specific-skill training and development; early work history; occupational



choice; organizational/job choice and switching; the sequence of jobs taken after organizational entry; work/family issues; midcareer plateaus; and retirement planning. I-O psychologists should be familiar with general workforce trends and patterns as well (e.g., protean careers, job crafting).

Knowledge in this area would reflect an understanding of these processes, events, or phenomena as they are considered both by the individual employee and from the perspective of the employing organization. Knowledge of how organizational practices such as recruitment, selection, job placement, socialization, training, performance appraisal, and career-planning programs enhance or retard career development is also necessary, as is an understanding of the special career issues and challenges faced by particular groups (e.g., women, ethnic minorities, the disabled).

### **9. Criterion Theory and Development**

Almost all applications of I-O psychology (e.g., selection, human resources planning, leadership, performance appraisal, organization design, organization diagnosis and development, training) involve measurements against criteria (standards) that indicate effectiveness and well-being of individuals, groups, and/or organizations, as well as inferences drawn from measures used to assess those entities. The selection of criteria is not a simple issue and represents a significant area of concern for I-O psychologists.

The knowledge base of this domain incorporates understanding the theoretical issues such as single versus multiple criteria, criterion dynamics, the characteristics of good and acceptable criteria (relevance, reliability, practicality), and criteria as a basis for understanding human behavior at work and in organizations. Common criteria of interest include but are not limited to work performance including task and contextual performance, withdrawal (lateness, absenteeism, turnover), counterproductive behavior, and health and well-being.

Beyond this knowledge, the I-O psychologist should have the skills necessary for developing valid criteria and methods of measuring them. These include skills in many of the other domains identified in the document (e.g., Job/Work Analysis, Research Methods).

### **10. Groups and Teams**

Much of human activity in organizations takes place in the presence of other people. This is particularly true of work behavior. The pervasiveness of interpersonal and task interdependence in organizations demands that I-O psychologists have a good understanding of the behavior of people in work groups. It is also critical to have a familiarity with the growing teamwork literature. This requires an understanding that extends beyond familiarity with research and theory related to interpersonal behavior in small groups. The body of theory and research concerning groups and teams draws from social psychology, organizational psychology, sociology, and organizational behavior. A good background in group theory and team processes includes, but is not limited to, an understanding of leadership, motivation, interpersonal influence, group effectiveness, conformity, conflict, role behavior, and group decision making. Contemporary issues include but are not limited to multi-team systems, virtual teams, and cross-cultural teams.

### **11. Human Performance**

Human Performance is the study of limitations and capabilities in human skilled behavior. Skill is broadly construed to include perceptual, motor, memory, and cognitive activities, and the integration of these into more-complex behavior. Emphasis is on the interaction of human behavior and tools, tasks, and environments, ranging from detection and identification of simple events to problem solving, decision-making, human errors, accidents, and control of complex environments. The variables that affect human performance include individual differences, disabilities, organismic variables, task variables, environmental variables, and training variables.

### **12. Individual Assessment**

This domain refers to a set of skills that are needed for assessing, interpreting, and communicating distinguishing characteristics of individuals for a variety of work-related purposes. The two primary purposes of individual assessment can be defined broadly as selection (e.g., hiring, promotion, placement) and development (e.g., career planning, skill and competency building, rehabilitation, employee counseling, coaching). Individual assessment may help attain multiple goals, many of which are aimed at achieving some form of person-environment fit, including assessee fit to a specific job or career track and assessee fit within a specific organizational context (e.g., department, work group).

Individual assessment incorporates skill in individual testing, interviewing, and appraisal techniques for the purpose of evaluating ability, personality, aptitude, and interest characteristics. Individual assessment also requires identifying, developing, selecting, and/or using the appropriate means for such assessment, and communicating the results and interpretation of assessment accurately in both face-to-face and written form.

In addition, knowledge of the manner in which environmental and contextual factors shape the purpose and use of the accumulated information of individual assessments is necessary.

### **13. Individual Differences**

I-O psychology emphasizes the role and measurement of individual differences in the study of work behavior. Because this emphasis requires accurate assessments of unobservable psychological traits, a sound background in both classical and modern measurement theories and their respective areas of application is essential. The domain of measurement includes theory and assessment of individual differences in skills, abilities, personality, motivation, and interests. This exposure would cover the nature of construct measurement and the philosophy-of-science assumptions underpinning many of our approaches to scale development. Other topics that might be covered are the measurement of attitudes (e.g., job satisfaction) by scaling procedures, the measurement of performance on complex jobs, and the measurement of comparable worth of individuals to organizations.

A great deal of what I-O psychologists do in this area is subjected to close scrutiny by courts of law, civil-rights groups, and professional colleagues. Because of these external and internal pressures, students must be trained to conduct research and to apply measurement principles in conformity with the highest standards of our discipline. Students may also need skills to help communicate their research methods and findings to interested parties outside of the discipline.

Although classical test theory offers an accessible introduction to key measurement principles, it is important to recognize alternative approaches to measurement. For example, questions about item and scale bias, test equating, minimum-competence assessments, mastery testing, tailored testing, and appropriateness raise issues that can be addressed by classical test theory, item response theory, and other solutions. Although psychometric applications were originally studied in relation to ability measurement, they have been generalized to other psychological constructs. Key topics in the arena of individual differences measurement include but are not limited to classical test theory, item response theory, psychometrics (reliability and validity), validation, scaling, and scale development.

### **14. Job Evaluation and Compensation**

This competency area focuses on determining the appropriate compensation level for skills, tasks, and/or jobs. Job evaluation is a process by which the relative value of jobs is determined and then linked to commensurate compensation. It is closely tied to and usually predicated upon sound job/task/work analyses. In general, job evaluation and compensation involve identifying compensable factors, interpreting market data, attending to perceptions of fairness and equity, and considering issues of comparable worth. Proficiency in this competency area is demonstrated by a theoretical and applied understanding of various job-evaluation techniques, compensation strategies (e.g., pay for skills, team-based pay), benefits, and the legal and social issues surrounding compensation.

### **15. Job/Task/Work Analysis/Competency Modeling and Classification**

This domain encompasses the theory and techniques used to generate information about what is involved in performing a task, a job, or more broadly, work; the physical and social context of this performance; and the attributes needed by an incumbent for such performance. Tasks are basic units of activity, the elements of which highlight the connection between behavior and result. A job is a grouping of tasks designed to achieve an organizational objective. It is common for jobs to be grouped or classified on the basis of a variety of criteria, depending on the purpose and goals of the classification system.

The fundamental concern of job/task/work analysis and competency modeling is to obtain descriptive information to design training programs, establish performance criteria, develop selection systems, implement job-evaluation systems, redesign machinery or tools, and create career paths for personnel. The specific steps taken and the type of information gathered will vary depending on the purpose of the job/task/work analyses and on the classification system. Relevant information includes, but is not limited to: what worker behaviors are involved; the knowledge, skills, and abilities required; personality attributes relevant to targeted outcomes; the standards of performance

desired; the tools, machines, and work aids used; the sources of information available to the incumbent; the social, environmental, and physical working conditions; and the nature of supervision. Similarly, some of the steps involved in job/task/work analyses include: identifying the purpose of the analysis; preparing, designing, or selecting a job-analysis system; collecting job/task/work information; summarizing the results; and documenting for future reference the steps taken. The classification of jobs typically entails identifying the purpose and goals of the classification system, designing a classification scheme, categorizing jobs according to the established scheme, and documenting the classification process and outcomes.

The individual who is competent in this domain should have knowledge of the different approaches to job/task/work analysis and classification, as well as skill in applying these techniques to real-world situations. This competency area is likely to continue to evolve as the nature of work in our society continues to change.

### **16. Judgment and Decision-Making**

Judgment and decision-making encompasses an area of research and knowledge that is both prescriptive and normative in its emphases. This area is important because judgment and decision making under conditions of uncertainty probably describes the majority of the decisions managers, psychologists, market forecasters, and budget/policy planners make during the course of their work and research. Knowledge of decision theory, judgment, and problem solving research, and heuristics and biases is important to understanding how information is processed and the quality of the individual-, group-, and organization- level decision outcomes.

Many different content areas within the broad area of I-O psychology can be studied explicitly as applications of decision and judgment theory including vigilance and choice behavior, negotiation, employee selection, performance appraisal, and human performance in complex environments. Applications of decision theory to the policies of decision makers allow for a greater understanding of inferential procedures used by individuals. Approaches for describing and predicting judgment and decision-making include Brunswik's lens model, Bayesian inference, subjective expected utility, prospect theory, and the cognitive information-processing paradigm. Knowledge of these approaches and an ability to integrate across the different approaches are indicative of breadth as well as depth of training in judgment and decision theory.

### **17. Leadership and Management**

Management and leadership can be approached from different levels (e.g., teams, organizations, countries). The study of management and leadership at the macro level involves the influences that senior-level individuals have in the larger organizational context such as setting strategy, directing change, and influencing values. Theory and research may focus on characteristics of leaders, leader style, leader-member interactions, behaviors of leaders, and related phenomena. At a more-micro level, leadership and management involves the day-to-day exchange between formal and informal leaders and followers. This includes challenges faced by line managers in their relationships with subordinates in assigning tasks, evaluating performance, coaching and counseling for improvement, resource planning, and related tasks. Effective leadership and management involve task analysis, motivation, decision-making, career planning, selection, performance appraisal, interpersonal communication, listening, and related skills in a supervisor-subordinate context. Within this domain, it is important to be aware of the advantages and disadvantages of the various objective and subjective/perceptual measures of leadership effectiveness and emergence. Increasingly, attention is placed on team leadership and self-leadership (especially in relation to empowerment) and on horizontal leadership (i.e., peer-influence processes).

### **18. Occupational Health and Safety**

Organizations can have significant impact on employee health, safety, and well-being. This competency area requires the study of interactions between human physical capabilities and conditions in the workplace in an attempt to understand the limits of performance and both positive and negative effects on workers. Among the factors considered are hazardous working conditions induced by toxic substances (e.g., chemical, biological, nuclear), loud noises, blinding lights, noxious odors, etc. Other factors considered are related to organizational structure and job design such as shift work or the requirements of particular tasks. Additional sources of organizational stress that may affect performance and attitudinal variables include downsizing, mistreatment (e.g., abusive supervision, harassment, incivility), work-nonwork pressures, and outsourcing. I-O psychologists should be familiar with laws (e.g., Americans with Disabilities Act) and government regulations and standards relating to the workplace (e.g., Occupational Safety and Health Administration law and regulations), as well as with physiological measures of psychological constructs. I-O Psychologists should also have awareness of how these issues play out and are being

addressed in the developing world (where standards and legal protections are lacking, where poverty and ill-health are considerably more rampant, and where individuals work within more informal economies).

### **19. Organization Development**

This domain encompasses theory and research relevant to changing individuals, groups, and organizations to improve their effectiveness. This body of theory and research draws from such related fields as social psychology, counseling psychology, educational psychology, vocational psychology, human factors, organizational behavior, and organizational theory.

Organization development concerns theory and research related but not limited to individual change strategies (e.g., training, socialization, attitude change, career planning, counseling, and behavior modification), interpersonal and group change strategies (e.g., team building and group training, survey feedback, and conflict management), role- or task-oriented change strategies (e.g., job redesign, role analysis, management-by-objectives, and temporary task forces), and organization-system-directed change strategies (e.g., survey feedback, open-systems-oriented change programs, human-resource accounting, flexible work hours, structural changes, control-system changes, and quality circles). I-O psychologists should know how to diagnose problems and challenges in organizational settings and be able to design and evaluate the outcomes of organization development interventions (e.g., program evaluation).

### **20. Organization Theory**

It is well accepted that structure, function, processes, and other organizational-level constructs have an impact on the behavior of individuals in organizations. Therefore, it is useful for I-O psychologists to have a thorough understanding of the nature of complex organizations. This understanding should include, but is not limited to, classical and contemporary theories of organizations, organizational structure, organizational design, organizational culture/climate, organizational change including change management, technology, and the process of organizational policy formation and implementation.. Sociologists and those students of organizational behavior who study constructs at an aggregate level of analysis generate much of this theory and research. Multilevel theory acknowledges the importance of levels of analysis and the integration of organizational and individual constructs.

### **21. Performance Appraisal/Management**

Performance appraisal/management has both a knowledge and a skill base. This area (sometimes also referred to as Talent Management) centers on the methods of measuring and evaluating individuals as they perform organizational tasks, the influence of the social context in which they perform and are evaluated, and on taking action (administrative such as promotion/succession or rewards and/or developmental) with individuals on the basis of such appraisals.

The knowledge base includes a thorough understanding of rating-scale construction and use and rater training. Also relevant are the areas of psychometric theory, measure development, data analysis, criterion theory and development, motivation theory, and the factors that underlie interpersonal perception, judgment, and evaluation (i.e., rating). An understanding of the similarities, differences, and inconsistencies among the perceptions and evaluations of performance and feedback provided by peers, customers, subordinates, and supervisors is essential.

The skill base includes procedures for communicating performance evaluations to job incumbents and coaching them in appropriate means of improving their performance. Also, skill in designing a complete performance appraisal-/management-and-feedback system that meets organizational needs while maintaining and/or enhancing worker motivation and/or performance is required.

### **22. Personnel Recruitment, Selection, and Placement**

This domain consists of the theory and techniques involved in the effective matching of the needs, preferences, skills, and abilities of job recruits, job applicants, and existing employees with the needs and preferences of organizations. An organization's needs in this context are defined by the jobs assigned to positions in the organization.

This domain encompasses theory and research in: human abilities; test theory, development, and use; job analysis; criterion development and measurement; recruitment; classical and decision-theory models of selection and placement; various recruitment strategies; alternative selection devices (e.g., interviews, assessment centers); and legal and societal considerations that affect recruitment, selection, and placement. In particular, the individual must

keep current with the legislation and court decisions related to these issues, as well as with responses of SIOP to laws and their interpretations.

### **23. Training: Theory, Delivery, Program Design, and Evaluation**

This domain includes theory and techniques used to design, conduct, and evaluate instructional programs. The instructional process begins with a needs assessment, including organizational, job, task, and person analyses, to determine the goals and constraints of the organization and the characteristics of the job and of trainees. Familiarity with basic phenomena of learning (e.g., modern learning theory, conditioning principles), as well as knowledge of the different approaches to training (e.g., computer-assisted instruction, simulation, behavior modification) are necessary for designing programs and, depending on the I-O psychologist's position and employment sector, skill at delivering training and teaching others may also be required. An ability to develop meaningful and appropriate training objectives is essential. Transfer of training to the desired setting is also an important consideration. In order for programs to be conducted as planned, the instructors must have good instructional skills. Thus, training the trainers is necessary.

Both the process and the outcome of a training program may be evaluated to determine if it has been conducted as planned and whether it has had any effect. Knowledge of appropriate training-evaluation criteria and design issues, such as pre- and post-testing and control groups, as well as of organizational constraints is necessary for planning an evaluation strategy.

### **24. Work Motivation**

Work motivation refers to the conditions within the individuals and their environment that influence the direction, strength, and persistence of relevant individual behaviors in organizations when individual abilities and organizational constraints are held constant. Increasingly, work motivation is a concern at the group level as well.

I-O psychologists need to have a sound background in work motivation in at least three respects. First they must have a thorough understanding of the theories of human motivation including, but not limited to, need theories, cognitive theories, and reinforcement theories. In all cases there must be a thorough understanding of the extensive research and theory that exist outside the domain of work in the basic-psychological literature. At the second level, there must be an understanding of the research and theory in motivationally relevant domains of I-O psychology that represent general applications of one or more motivational perspectives. Such general strategies for work motivation as goal setting, job design, self-regulation, incentive systems, and participative decision-making are relevant here. Finally, there must be an awareness of and an ability to apply very specific, motivationally oriented practices that adapt motivational constructs to specific cases. For example, the effective implementation of many employee development practices involves an application of goal-setting principles and participation.

## **RELATED AREAS OF COMPETENCE**

### **25. Consumer Behavior**

Although consumer behavior is relevant to I-O Psychology, the academic discipline of consumer psychology falls under the purview of Division 23 of APA: The Society for Consumer Psychology. The focus of this area is the systematic study of the relationship between the producers (or distributors) and consumers (actual or potential recipients) of goods and services. Usually this involves many of the following concerns: consumer preferences for product features, consumer attitudes and motivation, buying habits and patterns, brand preferences, media research (including the effectiveness of advertisements and commercials), estimating demand for products or services, and the study of the economic expectations of people. Closely allied to those areas of market research which focus on personal consumption, there is a substantive or content basis to this domain insofar as there is a body of theory and data amassed dealing with the antecedents and correlates of consumer behavior. The skill component of this domain involves the appropriate application of a variety of social science research methodologies (e.g., sampling theory, questionnaire and survey protocol design and execution, individual and group interviewing, stimulus scaling, and mathematical model building). <http://www.myscp.org/>

### **26. Human Factors**

Although the field of human factors is relevant to I-O Psychology, the academic discipline of human factors falls under the purview of Division 21 of APA: Applied Experimental and Engineering Psychology. This discipline "promotes the development and application of psychological principles, knowledge, and research to improve

technology, consumer products, energy systems, communication and information, transportation, decision making, work settings, and living environments. The goal is safer, more effective, and more reliable systems through an improved understanding of the user's requirements" (<http://www.apa.org/about/division/div21.aspx>). Competency in this area assures awareness of issues of experimental design, a grounding in perception, cognition, and physiological psychology, some knowledge of computer programming, and quantitative modeling based on techniques from mathematical psychology, engineering, and computer science. Familiarity in the subject areas of basic experimental psychology should be combined with an awareness of applied research in such areas as work station design, workload measurement, control systems, information display systems, health and safety, and human-computer interactions.

### **Strategies for Building Competence**

Program designers and faculty may develop a student's capabilities in a recommended area by using one or more methods or techniques. In some cases it is likely that multiple means might actually be preferred over one approach/technique. A given course may touch upon more than one area. Moreover, the resources and capacities of a given program will also shape decisions in this area. For these reasons the guidelines will not detail a specific curriculum plan. However, suggested strategies are provided.

Table 2 describes curriculum options identified as useful methods for graduate-level training. While other approaches and variations do exist, the list in Table 2 is reasonably inclusive. It should also be acknowledged that many students will be exposed to and will obtain relevant knowledge of some competency areas (e.g., Fields of Psychology, History and Systems in Psychology) in an undergraduate psychology program.

Table 3 summarizes the recommendations of the guidelines by relating the goals of training to the methods or techniques identified. The entries in this table should be viewed as suggestions of reasonable and appropriate approaches to educating students in the desired knowledge and skill domains. Though the techniques identified are not necessarily the only ones available, an effort was made to match each competency area with the techniques most likely to be effective for development in that domain. The fact that there are multiple entries for training in a skill area should not imply that all techniques listed are required to promote a level of mastery deemed appropriate by a program's faculty. Finally, it would be consistent with the spirit of these guidelines for a program to develop skill or knowledge in several of the domains using a single particular educational experience (e.g., seminar, supervised field project, assigned reading list).

Though the guidelines are most specifically intended for curriculum development, they also serve as a guide for students in ensuring the adequacy of their education. It is our firm belief that students and faculty are equally responsible for students' education. In some cases this means students must take advantage of presented opportunities (e.g., taking a needed class, participating in a research project, attending conferences). It may also mean that students need to be proactive in developing their own opportunities (e.g., independent study, finding an internship, scouting research collaborations, developing a professional network, reading appropriate journals).

Furthermore, we encourage practitioners to continue to play an active role in the development of I-O psychologists. Giving students opportunities to work on applied projects, offering internships, and taking an active role in the education and training of master's and doctoral students (e.g., serving on the E & T Committee, contributing to master's and doctoral consortia, visiting and speaking at graduate programs) are all recommended and lauded activities.

Graduate education in I-O psychology must employ multiple methods of education and training. All of the approaches listed in Table 3 have value and should be integrated into a complete program of education and training. Such a program should ensure that the graduate will possess an appreciation of the roles of both theory and practice; will be able to develop new ideas and also to apply relevant information to solve real-world problems; and will possess the research, methodological, statistical and measurement knowledge and skills required to conduct appropriate research and to solve problems.

### **Summary**

The competency-based approach of these guidelines has much to recommend. It maintains a focus on what is to be taught and learned, provides desirable flexibility to curriculum planners, and recognizes the multiple paths to developing most skills of importance. Nonetheless, it is also true that the recommendations based on such an approach might become dated or irrelevant to the field. Therefore, the present guidelines should be reevaluated every ten years (APA, 2004). They must be kept up to date by continuous reference to the nature of work and conditions surrounding the I-O psychologist at work.

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**Table 1*****Areas of Competence to be Developed in I-O Psychology Programs*****GENERAL KNOWLEDGE AND SKILLS**

1. Ethical, Legal, Diversity, and International Issues
2. Fields of Psychology
3. History and Systems of Psychology
4. Professional Skills (Communication, Business/Research Development, Consulting, and Project-Management Skills)
5. Research Methods
6. Statistical Methods/Data Analysis

**CORE CONTENT**

7. Attitude Theory, Measurement, and Change
8. Career Development
9. Criterion Theory and Development
10. Groups and Teams
11. Human Performance
12. Individual Assessment
13. Individual Differences
14. Job Evaluation and Compensation
15. Job/Task/Work Analysis, Competency Modeling, and Classification
16. Judgment and Decision-Making
17. Leadership and Management
18. Occupational Health and Safety
19. Organization Development
20. Organization Theory
21. Performance Appraisal/Management
22. Personnel Recruitment, Selection, and Placement
23. Training: Theory, Delivery, Program Design, and Evaluation
24. Work Motivation

**RELATED AREAS OF COMPETENCE**

25. Consumer Behavior
26. Human Factors

Table 2

*Options for Training Competencies*

**1. Formal Course Work:** Traditionally classroom instruction led by a professor common to university settings in which material pertinent to the domains is covered. This method itself can involve a variety of different means, to include lectures, discussion, presentations, and so forth. While taking courses, students also have the opportunity to work together with peers, taking advantage of the benefits of cooperative peer learning.

**2. Independent Readings/Study:** Non-classroom instruction in which the student, in consultation with qualified personnel, assumes basic responsibility for and commitment to the accomplishment of domain objectives. This method includes all forms of non-classroom instruction for which self-initiated effort is of central concern and for which such effort can successfully result in the achievement of relevant domain objectives. Examples would include self-initiated effort aimed at covering defined domains through reading; generating appropriate review manuscripts, proposals or reports; designing and conducting a research investigation; and acquiring interactive computer skills. Also, staying abreast of current profession and workplace issues through independent reading of SIOP publications and various other media.

**3. Supervised Experience (and Field Research):** Non-classroom instruction in which the student is actively engaged in projects under the direct supervision of qualified personnel (e.g., faculty, senior students, I-O practitioners). Such projects are aimed at fulfilling specific training objectives with special emphasis given to the acquisition of skills. Participation is not motivated primarily by compensation. This method is often characterized by *in vivo* learning opportunities such that the student learns in settings similar to those to which transfer can be expected. Shoenfelt (2003) provides a checklist to facilitate successful experiences in applied projects that are incorporated into I-O psychology graduate training. Research experience should begin during the first year of graduate education with small projects and be expanded in later years as the student gains skill and knowledge in the field.

In all cases, however, there must be meaningful professional supervision of the training experience (Byrne et al., 2014). Examples would include practicum and internship experiences, field-work teaching/training, thesis/dissertation research, etc. An extensive (even year-long) supervised internship performing the work of an I-O psychologist in a business, consulting, or government organization is strongly recommended as an essential component of master's and doctoral preparation, especially for those who intend to become practitioners.

**4. On-the-Job-Training:** Non-classroom instruction in which capabilities are learned through "hands-on" experience on applied tasks under the explicit guidance of a professionally qualified task expert. Such training is typically done in conjunction with one's job, and participation involves compensation. In any event, on-the-job training provides firsthand knowledge of the problems associated with particular I-O domains and allows for the opportunity to focus on solutions that will have an impact on the setting in which the student is working.

**5. Modeling/Observation:** Non-classroom implicit instruction that is obtained as a result of working with and paying attention to professionally qualified personnel in the daily conduct of their jobs or projects. This method implies that learning of important skills might well be achieved without explicit instructional intent on the part of the model being observed. Conversely, modeling may also be done in a purposeful and self-conscious manner. Modeling/ observation, because of its general nature, cuts across several of the above training methods.

**6. Involvement in Funded Research:** Classroom instruction and faculty mentoring about national and state funding agencies that support I-O psychology research, where to locate calls for proposals, how to respond to these calls with competitive research proposals, completing corresponding projects, and reporting progress and results to the funding agencies.

**7. Collaborative Research:** Non-classroom instruction and faculty mentoring on developing a unique research question, designing a study, obtaining Institutional Review Board approval, conducting the study, and summarizing the results often in collaboration with others.

Table 3

*Means of Training the Recommended Competencies*

	Formal Course Work	Independent Reading/ Study	Supervised Experience (and Field Research)	On-the-job Training	Modeling/ Observation	Involvement in Funded Research	Collaborative Research
<b>GENERAL KNOWLEDGE AND SKILLS</b>							
1. Ethical, Legal, Diversity, and International Issues	*		*	*	*	*	*
2. Fields of Psychology	*	*				*	*
3. Professional Skills	*		*	*	*	*	*
4. History and Systems of Psychology	*	*				*	*
5. Research Methods	*	*	*		*	*	*
6. Statistical Methods/Data Analysis	*	*	*		*	*	*
<b>CORE CONTENT</b>							
7. Attitude Theory, Measurement, and Change	*	*		*		*	*
8. Career Development	*	*	*	*		*	*
9. Criterion Theory and Development	*	*	*	*		*	*
10. Groups and Teams	*	*	*		*	*	*
11. Human Performance	*	*	*	*		*	*
12. Individual Assessment	*		*	*	*	*	*
13. Individual Differences	*	*	*			*	*
14. Job Evaluation and Compensation	*	*	*	*		*	*
15. Job/Task/Work Analysis, Competency Modeling, and Classification	*	*	*	*		*	*
16. Judgment & Decision-Making	*	*				*	*
17. Leadership and Management	*	*	*		*	*	*
18. Occupational Health & Safety	*	*	*			*	*
19. Organization Development	*	*	*	*	*	*	*
20. Organization Theory	*	*	*			*	*
21. Performance Appraisal/Management	*	*	*	*	*	*	*
22. Personnel Recruitment, Selection, Placement and Classification	*	*	*	*		*	*

<b>23. Training: Theory, Delivery, Program Design, and Evaluation</b>	*	*	*	*	*	*	*
<b>24. Work Motivation</b>	*	*	*	*		*	*
<b>RELATED AREAS OF COMPETENCE</b>							
<b>25. Consumer Behavior</b>	*	*	*			*	*
<b>26. Human Factors</b>	*	*	*			*	*