Ergonomics Certification in the United States

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ABSTRACT

The mission of the Board of Certification in Professional Ergonomics (BCPE) is to support a standard of competency and advocate the value of certification. This paper highlights the key components of a U.S. "gold standard" certification, including the periodic updating of an exam and constantly evolving the method of administration to reflect best practice and user needs. The challenges of conducting outreach and promoting the value of certification is discussed, noting successes being brought about as a result of societal demand while challenges persist in persuading segments of the community of the value of ergonomics certification.

Keywords: Professional certification, Core Competencies, Certified Professional Ergonomist, Certified Human Factors Professional, Certified User Experience Professional, Ergonomics, Human Factors, User Experience

INTRODUCTION

Credentialing is common in the United States. Increasingly consumers search for an ergonomics practitioner using online search terms such as "certification" or "ergonomics", often unaware of the existence of the Board of Certification in Professional Ergonomics (BCPE) but assuming the existence of a certifying body. Overseeing the many professional certification systems in the U.S. are accrediting bodies that establish the standards of certification and accredit compliance with those standards. BCPE, as an organization, adheres to the criteria established by the Institute for Credentialing Excellence (ICE) and BCPE credentials were accredited by the National Commission for Certifying Agencies (NCCA) based on the former exam process. BCPE is currently working towards reaccreditation based on the new exam. Following such standards is considered the "Gold Standard" for certification bodies.

The NCCA standards of excellence are similar to those delineated in the late 1990s by the International Ergonomics Association (IEA) for credentialing excellence in Human Factors/Ergonomics (HFE) (NCCA, 2004; IEA, 2001). In 2001, BCPE became the first HFE certification group to be recognized by the IEA.

However, sustaining a high standard of certification is challenging. An outline of the BCPE certification requirements and process follow, which provides context to the discussion on the development of core competencies and the challenges of keeping certification contemporary. Anticipating changes in the profession and seeing opportunities to promote the benefits of certification for individuals and the HFE profession as a whole remains important.

OUTLINE OF THE BCPE CERTIFICATION PROCESS

Overview

The Board of Certification in Professional Ergonomics (BCPE) offers one comprehensive professional human factors/ergonomics certification, with a choice of designation to be selected by the certificant. A certificant can choose 'Certified Professional Ergonomist' (CPE), or 'Certified Human Factors Professional' (CHFP) or 'Certified User Experience Professional' (CUXP) as their designation according to the domain in which they work. The certification process comprises two stages. The first stage involves submission of an application that addresses certification requirements in terms of education and training, evidence of work products and HFE experience (minimum of three years). The application is redacted so that it is blind to two reviewers. Once the application is approved, in the second stage, the candidate is required to pass an examination. Every five years all certificants have to submit a Continuance of Certification form delineating continuing education and professional involvement during the preceding five-year period.

BCPE also provides Associate Professional certification as a stepping stone to the full professional certification. This level of certification can be obtained by satisfying the educational requirements. Usually those applying for the certification lack the three years of experience and/or do not have sufficient work products. Once they can meet these additional experience and exam requirements, they can apply to change their certification designation. The designation choices are similar to the professional ones but with an "associate" in place of the "certified" prefix; hence, AEP, AHFP or AUXP.

Requirements

Recently, the BCPE has modified the education requirements. The minimum requirement has been changed from a master's degree to a bachelor's degree. However, the applicant must meet the educational requirements specified by the core competencies, as indicated below. The curriculum criteria, e.g., number and type of academic credits, effectively renders the educational component equivalent to a master's program. This updated model reflects the fact that HFE is a diverse field and applicants may have acquired appropriate training through a variety of programs without necessarily earning a master's degree. The change allows for needed flexibility in the educational component, yet retains the elements that are critical for competent practice. In effect, this change appropriately places the emphasis on the core competencies of the profession.

Other requirements in the application process relate to evidentiary work products. Two examples are required in each of three areas; analysis, design and test and evaluation. In addition, the applicant also has to have three years equivalent of HFE work experience. This requirement aligns with the duration of the Associate Professional level, being 6 years, allowing an applicant who is only doing HFE on a part time basis to qualify for full certification at the end of the 6 years.

Exam

BCPE has recently completed the development of a new exam, based on an extensive field survey of practitioners. Unlike the former 8-hour paper exam that had three parts, some being short answer style, the new exam is a single 3-hour exam and is entirely multiple-choice. In addition, the new exam is conducted electronically on computers at proctored test centers throughout the U.S. as well as overseas, where new sites are increasingly being developed. Besides having an extensively expanded set of validated questions, a key change is the deletion of the paper and pencil component of the test, which was not only time consuming to score but could be criticized as relying on subjective judgment. The new exam was piloted early 2014. Based on the psychometric analysis of the pilot exam, a new validated exam will be offered twice a year beginning with the exam window of September/October 2014.

CORE COMPETENCIES

Historically, the BCPE core competencies (formerly known as the 'Ergonomist Formation Model') were technology-based and built on the body of knowledge of the profession in the published literature, curriculum criteria of professional societies and information from IEA federated societies. To keep up with the changes of the

profession, periodically the BCPE conducts field studies or job analyses of current professional practice. The results of these surveys are used to update the core competencies, and subsequently the exam. This reality-based approach to updating requirements is at the very heart of a "gold standard" of certification in the U.S. Table 1 summarizes the BCPE core competencies. They are more "human-centered" in essence than "technology-based", and they form the basis of the new exam. The percentages indicated for each section represents the proportion of the exam that is devoted to the topic, and is based on data collected in the field study.

Recently an independent several-part study was published that validates the core competencies listed in Table 1 (Rantanen and Moroney 2011, 2012; Moroney and Rantanen, 2012). Moreover, in surveys of relevancy that were given to students of HF/E programs anticipating entry into the workforce, recent new professionals in their first jobs and managers of new professionals all of these Core Competencies (formerly, Ergonomist Formation Model Revised) were considered highly relevant.

Table 1: BCPE Core Competencies (BCPE, 2014)

(Percentages reflect exam content based on field study results)

A. **Basic Principles of Ergonomics** (13.7%)
   1. System Concepts (6.7%)
   2. Design Concepts (7.0%)

B. **Core Background Relevant to Ergonomics** (13.5%)
   1. Human Attributes (7.3%)
      1.1 Anthropometry and Demography
      1.2 Physiology and Biomechanics
      1.3 Psychology
   2. Environmental Context (6.2%)
      2.1 Physical Environment
      2.2 Social Environment
      2.3 Organizational Environment

C. **Core Methodology: Analysis and Design of Processes and Products** (25.4%)
   1. Statistics and Design of Investigations (6.2%)
   2. Basic Process Analysis (6.5%)
   3. Design Methods (6.4%)
   4. Basic Usability (6.3%)

D. **Methods and Content Specific to Application Area** (30-6%)
   1. Human-Machine Interaction (7.1%)
   2. Human-Environment Interaction (6.4%)
   3. Human-Software Interaction (5.8%)
   4. Human-Job Interaction (5.9%)
   5. Human-Organization Interface (5.4%)

E. **Application** (11.8%)

F. **Professional Issues** (5.0%)

The NCCA has a total of 21 standards for achieving excellence in a certification system, to which BCPE subscribes. Conducting regular field studies is but one (NCCA, 2004). The standards also address the organization's governance structure and procedures, including having a public member serve on the Board of Directors. Additionally, certificants are required to be recertified periodically. Other requirements relate to transparency of the overall process of certification. Meeting these accreditation standards is an ongoing preoccupation and a challenging responsibility for BCPE staff and volunteers.

KEEPING CONTEMPORARY

The principal focus and challenge for BCPE is aligning with current practice. The field is diverse and the rate of technological change leads to new and expanding fields within the profession. As soon as BCPE completes the current pilot exam, another field study will be launched that will confirm or update the core competencies and, consequently, the exam. As a small entity, albeit the largest HF/E certifying body (having 1,236 certificants in total), the cost in time and money to keep current is considerable.

At the same time, BCPE must keep an eye on the national and international trends of the profession to anticipate areas of growth. Not only does this influence practice but also helps to market the benefits of certification. For example, recently the U.S. government has mandated human factors studies for medical device development. BCPE is beginning to see increased interest in certification for those practicing in the medical device design area as they seek to differentiate themselves in the growing market.

A certification body also needs to respond to those they serve - the certificants, potential certificants and the public. In response to the challenging economic times that makes traveling more difficult, BCPE has developed an exam that is electronically administered at proctored test centers. There are many sites nationally and the number of sites internationally is also growing. While this approach does not decrease BCPE costs it is more practical in that it reduces dependence on volunteers.

In addition, outreach continues to students and professors in the form of educating both groups about the benefits of certification. Some schools in the U.S., for example, encourage all their graduates to apply for certification and the staff strives to set an example by being certified as well. Recently there has been an increase in Associate Professional level applications with 145 associates certified. Most of these applications are from students of HF/E programs but BCPE also accepts applications with diverse backgrounds that meet the stringent educational requirements, namely a bachelor's degree and courses that, at a minimum, span the full set of core competencies.

The majority of BCPE certificants hold the CPE designation (80%). It is interesting to note that in the U.S., the term 'ergonomics' connotes physical HF/E. The market forces in safety and health have lead to a steady increase in certification as the CPE designation has grown in recognition. Although not all CPEs are in the physical ergonomics domain, the high numbers with this designation indicates there are fewer certificants from the cognitive and usability/user experience domains that seek certification. As a result, BCPE plans to reach out more to these communities to explain the value of certification. BCPE certificants themselves, especially leaders in the profession, assist us greatly in this arena by publishing articles that attest to the need and value of BCPE certification (Wischanski, 2014).

Of course, all of this is, in the end, in service to the public. However, more can be done to serve the public beyond establishing and maintaining a standard of competency in the profession. A natural extension of BCPE's role is to be effective in helping the public find qualified practitioners who are suitable for the task at hand. BCPE is revising its website and will develop a directory specifically for consultants so that the public may easily find the services they seek.

CONCLUSIONS

Fulfilling the mission of BCPE is challenging. BCPE strives to meet the 'gold standard' of certification which entails keeping up to date with the profession, not only in content of core competencies and examination but also in exam administration methods. Outreach and promotion of the benefits of certification are influenced by market trends, sometimes to our benefit. BCPE relies heavily on the support of certificant volunteers in industry and academia who are strong advocates for the profession and its certifying arm.

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