What does it mean to be a "professional" ... and what does it mean to be an ergonomics professional?

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ABSTRACT

An extensive literature on professionalism from many domains was reviewed to identify basic elements generally recognized as necessary for being considered a "professional". The literature revealed six criteria generally recognized as being necessary of professionals; these criteria were used to define what is necessary of an ergonomics professional. The Foundation for Professional Ergonomics sponsored this position paper as a means to direct discussion about professionalizing the ergonomics discipline and to direct future activities for promoting professionalism and professional development within the ergonomics community.

Background

In 1899, eleven individuals joined together to establish the American Society of Landscape Architects (ASLA), in part, to pursue a vision of landscape architecture as a design profession. Today, the ASLA has over 16,500 members affiliated with 48 chapters representing all 50 states in the USA, US territories, and 42 countries around the world; several thousand of their members have achieved "professional" status and are licensed in 47 states in the USA (www.asla.org). The ASLA has achieved its success through many years of concerted effort by many people of differing opinions about what it means to be a professional and how to measure professional stature. Although the ASLA has established a successful and well recognized formal process for achieving "professional" status, there are ASLA members and landscape design practitioners who question the process, the criteria adopted, and the measurement instruments used. Pioneering landscape architects, like Frederick Law Olmsted (in the late 19th century) and Jens Jensen (in the early 20th century), were self-taught and developed their principles and philosophies of design without formal education or training. In Jens Jensen's case, he (according to Grese, 1999) thought of landscape architecture as a craft and not as a profession, and, although he used the label "landscape architect" on some of his drawings, preferred the title "maker of natural parks and gardens". Jensen is reported to have said of his landscape architect contemporaries that they "had practically killed the art" from their "fear of being classed with craftsmen rather than professionals" (Grese, 1999).

The Human Resource (HR) Certification Institute began certifying HR professionals in 1976 nearly 30 years after Dr. Herbert Heneman, Jr., Professor of Industrial Relations at the University of Minnesota, published a paper on "Qualifying the Professional Industrial Relations Worker" in 1948 expressing the need to certify personnel professionals (see http://www.hrci.org/AboutUs/HISTORY/; and http://www.findarticles.com/p/articles/mi_m3495/is_n11_v38/ai_14837381). Dr. Heneman stated that the keys to a certification program are: "a code of ethics, and an objective measure of technical competence". Over the next 25 years the American Society of Personnel Administrators (ASPA, the national association created in the late 1940s to advance the personnel management profession) debated the questions of: (1) What body of knowledge must personnel professionals know?; (2) Who defines that body of knowledge?; and (3) How do you objectively measure it? Participants at a 1968 ASPA meeting organized to lay the groundwork for a certification program (originally designated "accreditation") agreed on the following five characteristics of a profession:

1. A profession must be full-time.
2. Schools and curricula must be aimed specifically at teaching the basic ideas of the profession, and there must be a defined common body of knowledge.
3. A profession must have a national professional association.
4. A profession must have a certification program.
5. A profession must have a code of ethics.

Additional evidence of the time, effort, and sacrifice needed to transform a discipline into a recognized profession is provided by the American Medical Association (AMA) (see http://www.ama-assn.org/ama/pub/category/8291.html) and by the history of teacher certification summarized by Diane Ravitch in her paper "A Brief History of Teacher Professionalism" (see http://www.ed.gov/admins/tchrqual/learn/preparingteachersconference/ravitch.html). As stated in the AMA website: "At the first official meeting of the American Medical Association at Philadelphia in 1847, the two principal items of business were the establishment of a code of ethics and the creation of minimum requirements for medical education and training." Ravitch states that "In the first half of the nineteenth century, the requirements for entry into teaching were modest: new teachers had to persuade a local school board of their moral character, and in some districts, pass a test of their general knowledge. In 1834, Pennsylvania became the first state to require future teachers to pass a test of reading, writing, and arithmetic. By 1867, most states required teachers to pass a locally administered test to get a state certificate, which usually included not only the basic skills, but also U.S. history, geography, spelling, and grammar." In addition, she states: "Teacher certification in the nineteenth century was irregular and diverse. There was no single pattern, and there was no teaching profession as such; this changed, however, at the beginning of the twentieth century."

Today, human factors and ergonomics is recognized as a design discipline distinct from any other (Meister, 1977, 1989, 1997; Kuorinka, 2000; also visit www.bcpe.org). As the Human Factors and Ergonomics Society (HFES) celebrates its 50th anniversary, the debate continues, though, within that society of approximately 5000 members (approximately 1000 of whom have achieved "professional" status as certified by the BCPE) about what it means to be a professional and whether or not professional stature is desirable for human factors and ergonomics practitioners. The history of the debate within the Human Factors and Ergonomics Society is long and well documented (Jahns, 1991, 1992). Notably, however, in 1990 (after 20 years of concerted but unsuccessful effort to establish a professional certification program within the HFES) a group of ten HFES members joined together to independently establish the Board of Certification in Professional Ergonomics (BCPE) to pursue a vision of ergonomics as a design profession. Although the BCPE has established a successful and well recognized formal process for achieving "professional" status, there are HFES members and ergonomics practitioners who question the process, the criteria adopted, and the measurement instruments used.

As is evident in other efforts to "professionalize" an occupation, these questions about the process, criteria, and measurement instruments are expectedly common and need to be voiced and openly discussed. A literature search using the keyword "professionalism" will, today, reveal hundreds of publications from dozens of domains (Law, Medicine, Education, Engineering, Accounting, Social Work, Library Service, Computing, Military Service, and others) all concerned with these questions. In a recent issue of the Industrial Engineer (February 2006), a reader posed the following question and comment to that journal's "Ask the Expert": *"Is industrial engineering a profession? I say no because lots of professional elements are missing. ... What must be done to turn this interest area we call industrial engineering into a real profession?"* The "expert" who was asked to reply to the reader's question and comment attempted to persuade by stating that industrial engineering, because it is an engineering discipline, is already a profession ("*all engineering disciplines are recognized as professions*"). The question and the response are representative of the challenges faced when trying to discuss "professionalism": the reader was expressing a view that some "professional elements" were missing, so, he/she had some criteria for professionalism in mind that were not being met; the expert was expressing that engineering is a profession, and, therefore, industrial engineering is a profession ... end of discussion. The response may not have satisfied because it did not address legitimate gaps viewed by the reader.

Another confounding aspect in attempts to professionalize an occupation, or to have a conversation about it, is early adoption and casual use of the term "professional" without the structure and discipline required for wide-spread social recognition. To some, it is not an issue of what society at-large recognizes as a profession; it is only necessary within the smaller, select community that their vocabulary includes the use of the term "professional". In the case of human factors and ergonomics, for instance, the HFES strategic plan (HFES 2005-2006 Directory and Yearbook, 2005) refers to its mission as serving and representing its members as "the premier scientific, engineering, and professional practice organization for the discipline of human factors/ergonomics". The text of their strategic plan includes several other references to "professional", including one goal, in particular, of developing, maintaining, and endorsing "professional standards for human factors/ergonomics professional education, research, and practice".   The HFES also makes several references to "professional" performance, behavior, and qualifications in their Code of Ethics (HFES 2005-2006 Directory and Yearbook, 2005). Based on these documents, it appears that the HFES accepts the concept that each of its members has achieved the status of "professional", perhaps simply by being a member of the HFES (or by self-recognition of practice within the field of human factors/ergonomics).

A position of this paper is that it is not sufficient to simply state that one is a professional, but rather there are recognized criteria for what it means to be a professional, and therefore, in the case of ergonomics, there are definable and measurable criteria for what it means to be an ergonomics professional. The remainder of this paper will be in support of

this position. In addition, we conclude with recommendations for actions by the Foundation for Professional Ergonomics to promote professionalism and professional development within the ergonomics community.

What does it mean to be a "professional"?

Evetts (2003a) provides a comprehensive review of the sociology of professionalism, and describes an extensive sociological literature comparing and contrasting interpretations of "professionalism". She highlights the different interpretations of professionalism into two groups: professionalism as a value system and professionalism as ideology. Of particular interest to her is the question of the appeal (sociologically speaking) of professionalism. She asks, "Why and in what ways have a set of work practices and relations, that historically have characterized medicine and law in Anglo-American societies, resonated first with engineers, accountants and teachers, and now with pharmacists, social workers, care assistants, computer experts, and law enforcement agencies in different social systems around the world"? She observes that "the meaning of professionalism is not fixed ... and sociological analysis of the concept has demonstrated changes over time both in its interpretation and function". It is her opinion that "all of these different interpretations are now needed in order to understand the appeal of professionalism in new and old occupations, and how the concept is being used to promote and facilitate occupational change". Interestingly, she notes that "accountability and performance indicators have now become a fundamental aspect of professionalism".

In an editorial comment in the Journal of Cancer Education, O'Donnell (2004) draws on several sources to express a current view of professionalism in medicine. He adopts a definition put forward by Cruess, et al (2004), which states that a profession is:

> "An occupation whose core element is work based upon the mastery of a complex body of knowledge and skills. It is a vocation in which knowledge of some department of science or learning or the practice of an art founded upon it is used in the service of others. Its members are governed by codes of ethics and profess a commitment to competence, integrity and morality, altruism, and the promotion of the public good within their domain. These commitments form the basis of a social contract between a profession and society, which in turn grants a monopoly over the use of its knowledge base, the right to considerable autonomy in practice and the privilege of self-regulation. Professions and those served are accountable to those served and to society."

Cruess, et al (1997) state that medical professionals have the following attributes:

> "Competence (to master and keep current the knowledge and skills relevant to medical practice)
> Commitment (being obligated or emotionally impelled to act in the best interest of the patient)
> Autonomy (freedom to make independent decisions in the best interests of patients and for the good of society)
> Altruism (the unselfish regard for, or devotion to, the welfare of others; placing the needs of the patient before one's self-interest)
> Integrity and Honesty (firm adherence to a code of moral values; incorruptibility)
> Morality and Ethics (to act for the public good; conformity to the ideals of right human conduct in dealing with patients, colleagues, and society)
> Self-regulation (the privilege of setting the standards; being accountable for one's actions and conduct in medical practices)
> Responsibility to Society (the obligation to use one's expertise for, and to be accountable to, society for those actions, both personal and of the profession, which relate to the public good)
> Responsibility to the Profession (the commitment to maintain the integrity of the moral and collegial nature of the profession and to be accountable for one's conduct to the profession)
> Teamwork (the ability to recognize and respect the expertise of others and work with them in the patient's best interest)."

The Supreme Court of Ohio Commission on Professionalism (2002) published a set of guidelines to enhance the quality and variety of "continuing legal education" (CLE) programs on professionalism in Ohio. In their guidelines document, the Commission references definitions of professionalism by Harvard Law School Dean Roscoe Pound (1953): "The term refers to a group pursuing a learned art as a common calling in the spirit of public service -- no less a public service because it may incidentally be a means of livelihood. Pursuit of the learned art in the spirit of public service is the primary purpose"; and by the Professionalism Committee of the American Bar Association (1995): "A professional lawyer is an expert in law pursuing a learned art in service of clients and in the spirit of public service, and engaging in these pursuits as part of a common calling to promote justice and pubic good". The six components of professionalism: "ethics and integrity, competence combined with independence of judgment, meaningful continuing learning, civility, obligations to the

justice system, and pro bono service" expressed by Shestack (1998) were also referenced by the Ohio Commission. The Commission summarizes their comments on what professionalism means to lawyers by stating "whether a lawyer prefers Dean Pound's definition or a more recent articulation, professionalism may best be thought of as a broad concept that includes the values of achieving and maintaining competence; acting with integrity, committing to a life of service; and seeking justice for all. Commitment to these basic values is what makes a lawyer's work professional."

Associate Justice Sandra Day O'Connor (1999), in a speech dedicating a new Law Center at the University of Oregon, went to some length to describe expressions of dissatisfaction felt by lawyers in their professional lives, and dissatisfaction felt by the public at-large with the law profession. Justice O'Connor commented that "unlike other occupations that may be equally respectable, ... membership in a profession entails an ethical obligation to temper one's selfish pursuit of economic success ... for the goal of public service."

In an essay on "Professionalization of Exercise Physiology", Boone (2001) describes for exercise physiologists (academicians and practitioners) observations on why exercise physiology is an "emerging profession". "It is interesting", he says, "to note that exercise physiologists do behave as professionals. Three criteria, in particular, highlight this point of view: First, if the exercise physiologist believes he/she knows what is the better fitness program for 'whatever' than the client, then the exercise physiologist is performing as a professional. That is, the exercise physiologist demonstrates a certain autonomy of judgment about health, fitness, rehabilitation, and sports training issues. Second, if exercise physiologists form a professional organization, such as ASEP, to protect the autonomy of the profession through certification, licensure, and accreditation, then the exercise physiologists are performing as professionals. Third, if exercise physiologists demonstrate specific competence in applying their shared knowledge to benefit society, then they have achieved professional status." Dr. Boone notes, also, that "As members of an occupation commit themselves as professionals, the level of professionalism rises and, thus, the professionalization of the occupation moves closer to the professional status that ultimately defines the profession."

A task force established by the American Association of Colleges of Pharmacy Council of Deans and the American Pharmaceutical Association Academy of Students of Pharmacy published a white paper (Benner and Beardsley, 1999) to raise awareness and recommend actions on issues of pharmacy student professionalism. They used the following definitions in their white paper:
"A *profession* is an occupation whose members share the following ten, common characteristics (Friedson, 1970; Argyris and Schon, 1974):
1. Prolonged specialized training in a body of abstract knowledge.
2. A service orientation.
3. An ideology based on the original faith professed by members.
4. An ethic that is binding on the practitioners.
5. A body of knowledge unique to the members.
6. A set of skills that forms the technique of the profession.
7. A guild of those entitled to practice the profession.
8. Authority granted by society in the form of licensure or certification.
9. A recognized setting where the profession is practiced.
10. A theory of societal benefits derived from the ideology.

A *professional* is a member of a profession who displays the following ten traits:
1. Knowledge and skills of a profession.
2. Commitment to self-improvement of skills and knowledge.
3. Service orientation.
4. Pride in the profession.
5. Covenantal relationship with the client.
6. Creativity and innovation.
7. Conscience and trustworthiness.
8. Accountability for his/her work.
9. Ethically sound decision making.
10. Leadership.

Professionalism is the active demonstration of the traits of a professional."

Although, perhaps, this task force did not constrain their criteria to those that can be measured, they did make an effort to be comprehensive and to stimulate discussion of what it means to be a professional pharmacist.

Lubet (1999) addressed the concepts of professional ethics and professionalism in a survey of what he refers to as "the undeveloped field of expert witness ethics and professionalism". He states "the term 'professional ethics' typically refers to the distinct, mandatory responsibilities undertaken by individuals in the course of practicing a trade or calling. Breaches of professional ethics may result in discipline, fee forfeiture, or other adverse consequences. In contrast, the term 'professionalism' is often used to identify admirable, model, or ideal conduct that is generally expected within a given profession --- but not absolutely required." He concludes his article with the following comment that is directly relevant to many ergonomics practitioners and to a need expressed in this position paper: "As modern litigation continues its march toward increasing technical complexity, it will become more important to define and understand issues of ethics and professionalism as they relate to expert witnesses."

In the field of organizational design (and the ergonomics sub-discipline of macroergonomics), "professionalism" is defined as the level of professional education and training one possesses (or that a job requires). It has been noted within this community that as the level of professionalism increases, the level of formalization (for example, by externally imposed controls for guiding organizational behavior through standard operating rules, regulations, and highly detailed job descriptions) should decrease. This concept is based on the belief that moral and ethical principles become internalized as an integral part of professional education, and thus reliance is on the ability of the individual professional to use his or her expertise to respond effectively to unanticipated situations (Robbins, 1983; Hendrick and Kleiner, 2001, 2003).

Because it is a relatively obscure reference, but very relevant to this position paper, we are devoting considerable space (everything indented below) to quotations extracted from Dr. William E. Wickenden's pamphlet "The Second Mile: A Re-Survey" published in 1944 by the Engineer's Council for Professional Development. [See also, Louis T. Rader's address "Is the Engineer a Professional?" presented at a 1957 AIEE meeting in which he refers to Wickenden's paper, http://www.egr.vcu.edu/egr/rader_paper/lect2.pdf; and Wickenden (1949)].

Introduction:
"Every calling has its mile of compulsion, its round of tasks and duties, its code of personal relations, which one must traverse day by day to survive. Beyond that lies the mile of voluntary effort, where people strive for special excellence, seek self-expression more than material gain, and give that unrequited margin of service to the common good which alone can invest work with a wide and enduring significance. The best fun of life and most of its durable satisfactions lie in this second mile, and it is only here that a calling can attain to the dignity and distinction of a profession.

What Professions Have In Common:
In searching for definitions of a profession you will probably find four kinds. One is likely to hold that the determining quality is an attitude of mind, that an altruistic motive can lift any honorable calling to the professional level. A second may say that it is a certain kind of work, one requiring special skill on a high intellectual plane. A third may state that it is a special order in society, as the bar, the bench, or the clergy. Still others insist that no work can be professional without a confidential relationship between a client and his agent, as that of patient to physician, litigant to lawyer, etc. None of these definitions is self-sufficient. Taken together, like the legs of a table, they give a profession a stable base of support.

The Individual and the Group:
Suppose a person were to say, 'I'll be a professional, but I'll do it myself; I hate organization dues and duties.' One would be tempted to reply, 'So you'll take the head, without the body which nourishes it.' Or suppose another were to say, 'Oh! I'll join all right, but I'll never do anything about it,' to which a fair answer would be, 'So you'll grasp the form and let the substance go.' Full professional life can not be achieved in isolation; ... it needs a culture medium in which to grow and flourish. Some aspects of professional life are essentially individual, while some are essentially group relations. What is the distinctive mark of the professional? First, we may say that it is a type of activity which carries high individual responsibility and which applies special skill to problems on a distinctly intellectual plane. Second, we may say that it is a motive of service, associated with limited rewards as distinct from profit. Third, is the motive of self-expression, which implies joy and pride in one's work and a self-imposed standard of excellence. And fourth, is a conscious recognition of social duty to be fulfilled among other means by guarding the ideals and standards of one's profession, by advancing it in public understanding and esteem, by sharing advances in technical knowledge, and by rendering gratuitous public service, in addition to that for ordinary compensation, as a return to society for special advantages of education and status.

Next, what attributes mark off the corporate life of a group of persons as professional in character? We may place first a body of knowledge (science) and of art (skill) held as a common possession and to be extended by united effort. Next is an educational process based on this body of knowledge and art, in ordering which the professional

group has a recognized responsibility. Third is a standard of personal qualifications for admission to the professional group, based on character, training, and proved competence. Next follows a standard of conduct based on courtesy, honor and ethics, which guides the practitioner in relations with clients, colleagues and the public. Fifth, we may place a more or less formal recognition of status, either by one's colleagues or by the state, as a basis for good standing. And finally, there is usually an organization of the professional group, devoted to its common advancement and its social duty, rather than to the maintenance of an economic monopoly.

What a Profession Must Guarantee:
When a layperson comes face to face with the complex and often terrifying specialization of professional skill and knowledge, that person is likely to be baffled or easily misled. To protect the layperson, the public wisely puts the burden of guaranteeing at least minimum standards of competence and ethics on the profession itself. The state may implement the obligation of a profession to guarantee competence by designating a group of its members to conduct professional examinations and to issue public licenses to those who pass them successfully, or it may leave professional bodies free to issue their own credentials. Both of these practices may exist side by side. In the end, it comes down to the same principle --- a profession must guarantee to the public the trustworthiness of its practitioners.

Professional Obligations:
Codes and police powers alone do not suffice to sustain the personal and corporate obligations of a profession any more than statutes and courts alone can assure the healthy life of a community. Equal importance attaches to the state of mind known as professional spirit which results from associating together people of superior type, and from the adherence to a common ideal which puts service above gain, excellence above quantity, self-expression above pecuniary motives, and loyalty above individual advantage. No professional person can evade the obligation to contribute to the advancement of the professional group. A person's skill is rightly held as a personal possession and when imparted to another justly deserves a due reward in money or in service. The person's knowledge, however, is to be regarded as part of a common fund built up over the generations, an inheritance which is freely shared and to which each is obligated to add; hence the duty to publish freely the fruits of research and to share the advances in professional technique. If the individual lacks the ability to make such contributions personally, the least that can be done is to join with others in creating common agencies to increase, disseminate and preserve professional knowledge and to contribute regularly to their support. That is the purpose to which a large share of the membership dues of professional societies is devoted.

Does an Engineer Need the Profession::
Engineers, in a society based largely on group relations, need their profession to safeguard their occupational and economic welfare. Engineers need protection against unethical competition, against indiscriminate use of the title 'engineer', and against all influences which might undermine public confidence in their integrity and competence. The engineer needs the benefits of prestige built up through group publicity. Engineers need a collective instrument for shaping public policy in the realm of their responsibility. It is true that a professional organization is primarily a moral agency and not in itself an economic or political pressure group, but in the long run moral agencies are the more powerful and enduring.

A Look Ahead:
Let us look into the next 50 years, which our present student engineers are to share in shaping. ... The engineering profession ... can not afford to become either a narrow caste of highly skilled technicians or a free-for-all alumni association of engineering graduates. It will probably never be able to define its boundaries precisely, nor become exclusively a legal caste, nor fix a uniform code of educational qualifications. Its leaders will receive higher rewards and wider acclaim. The rank and file will probably multiply more rapidly than the elite, and rise in the economic scale to only a moderate degree.

The engineer's job will be so varied, and will change so fast, and the tools will increase in variety and refinement with the advance of science, that no engineer can hope to get a once-and-for-all education in advance. We should cease to think of education as a juvenile episode. We should expect to re-educate engineers either continuously or at intervals throughout their active careers. ... This is no time for engineers to wrap themselves in the mantle of isolation; let us get together and be about our common business."

Of course, although Dr. Wickenden was an engineer and was speaking to an engineering forum, his words on "what it means to be a professional" generally apply to other occupations ... including ergonomics.

There are many other references, recent and aged, that can be cited that provide perspectives of "what it means to be a professional". Examples include: Evetts (2003b), Gillian (2004), Lively (2001), Lynch et al (2004), Rickover (1959),

Surdyk (2003), and Vetter (2005). One source that we'll conclude with, though, is the "Project Professionalism" report (1994), available at www.abim.org, sponsored by the American Board of Internal Medicine. The ABIM Foundation's web site (www.professionalism.org) also provides information about their activities for promoting medical professionalism. In their report, the authors defined the core of professionalism as "constituting those attitudes and behavior that serve to maintain patient interest above physician self-interest. Accordingly, professionalism ... aspires to altruism, accountability, excellence, duty, service, honor, integrity, and respect for others." The ABIM project can serve as an excellent model for projects to be sponsored by the Foundation for Professional Ergonomics.

Based on the publications reviewed, we observe the following criteria to be commonly recognized as basic elements for "what it means to be a professional". A professional is a person who:

1. has mastery of a complex body of knowledge and skills used in the service of others (a person who has achieved and is maintaining competence in that body of knowledge and set of skills).
2. demonstrates accountability to the public at-large and profession in common, and satisfies performance measures established by the profession [i.e., meaningful continuing learning; minimum standards of competence and ethics (in this regard, the state may implement the obligation of a profession to guarantee competence by designating a group of its members to conduct professional examinations and to issue public licenses to those who pass them successfully, or it may leave professional bodies free to issue their own credentials); a profession must guarantee to the public the trustworthiness of its practitioners].
3. is governed by a code of ethics.
4. expresses and demonstrates commitment to competence, integrity, and morality (i.e., a commitment to maintain the integrity of the moral and collegial nature of the profession and to be accountable for one's conduct to the profession), exhibits altruism (the unselfish regard for, or devotion to, the welfare of others; placing the needs of the public good before one's self-interest), and promotes the public good within their domain.
5. demonstrates autonomy in practice and judgment, and accepts the responsibility associated with the privilege of self-regulation (commonly joins with others to form a professional organization to protect the autonomy of the profession through certification, licensure, and accreditation).
6. exhibits a professional spirit which results from associating together people that adhere to a common ideal which puts service above gain, excellence above quantity, self-expression above pecuniary motives and loyalty above individual advantage (professionals contribute to the advancement of the professional group).

The following table summarizes criteria expressed in the literature for what it means to be a professional in the various domains reviewed:

Domain	Mastery of complex body of knowledge and skills used in the service of others	Accountability to public and profession: satisfies minimum standard of competence and ethics	Governed by code of ethics	Demonstrates commitment to competence and maintains integrity of the moral and collegial nature of the profession	Demonstrates autonomy in practice and judgment; accepts responsibility of self-regulation through certification, licensure, and accreditation	Exhibits professional spirit: contributes to advancement of the professional group
Medicine	Yes	Yes	Yes	Yes	Yes	Yes
Law	Yes	Yes	Yes	Yes	Yes	Yes
Education (K-12)	Yes	Yes	Yes	Yes	Yes	Yes
Engineering	Yes	Yes	Yes	Yes	Yes	Yes
Landscape Architecture	Yes	Yes	Yes	Yes	Yes	Yes
Human Resources	Yes	Yes	Yes	Yes	Yes	Yes
Pharmacy	Yes	Yes	Yes	Yes	Yes	Yes
Exercise Physiology	Yes	?	?	Yes	Yes	Yes
Ergonomics	Yes	Some	Yes	?	Some	Yes
Expert Witness	Yes	Yes	?	?	?	?

What does it mean to be an "ergonomics professional"?

So, then, given these generally accepted criteria, what is necessary for individuals within the ergonomics discipline to be recognized as professional?

Before proceeding, perhaps we should pause to state that we adopt the view expressed so well by Meister (1997) and affirmed by Kuorinka (2000) that ergonomics "is a distinct discipline, the major antecedents of which have been psychology and to a somewhat lesser extent engineering, with ancillary inputs from a wide variety of sources like physiology, safety, biomechanics, etc. Wherever technology impacts human performance or human capabilities and limitations affect the use of technology, our discipline (ergonomics) is involved to the extent that we wish it to be involved. Design is a fundamental ergonomics function. It itself has three components: *analysis* of a problem requiring a technological solution; the *design* itself or creation of a solution to the technological problem; and *test*, which is empirical determination that the design solution has solved the problem or, if it has not, suggests where changes in the design solution are needed."

Now, given that we've established some generally accepted criteria for what it means to be a professional, and that we adopt and promote Meister's definition of what it means to practice in the ergonomics discipline, what is necessary for individuals within the ergonomics discipline to be recognized as professional?

1. **An ergonomics professional must master a complex body of knowledge and skills (i.e., human factors and ergonomics) used in the service of others, and maintain competence in that body of knowledge and set of skills.**

   At some point in the practice of ergonomics, after obtaining a credential acknowledging completion of a formal education in ergonomics and after some time in gaining experience in using the knowledge and skills in the service of others, this criterion is met. The appropriate credential signifying a sufficient education and the number of years of practice must be established by the profession. The BCPE, in setting their standards, defined the minimum education to be an MS degree and the number of years of experience to be 4 years as criteria for receiving their CPE (Certified Professional Ergonomist) credential. The BCPE recognizes a continuum of professional development, and, therefore, also established a minimum education of a BS degree and 2 years of experience as criteria for receiving their CEA (Certified Ergonomics Associate) credential.

2. **An ergonomics professional must demonstrate accountability to the public-at-large and profession in common, and satisfy performance measures established by the profession (i.e., meaningful continuing learning; minimum standards of competence and ethics).**

   The BCPE is providing a means to demonstrate accountability to the public at-large and the profession in common through its certification examination process, and has adopted a code of ethics. The HFES has published a code of ethics to guide its members, as has the International Ergonomics Association (IEA) to guide its federated societies. BCPE certificants have demonstrated that they meet minimum standards of competence for ergonomics practitioners defined by the Board of Certification in Professional Ergonomics.

3. **An ergonomics professional must be governed by a code of ethics.**

   The codes of ethics published by the HFES, IEA, and the BCPE are designed to govern the behavior of ergonomists in professional practice. Although none of these organizations is large enough to have a formal enforcement procedure as do other large, recognized professions, each has developed their code of ethics with the intent that it would be a document used to govern professional behavior of ergonomists.

4. **An ergonomics professional must express and demonstrate commitment to competence, and maintain the integrity of the moral and collegial nature of the ergonomics profession. An ergonomics professional must be accountable for one's conduct to the profession, exhibit altruism, and promote activities in the public good within their domain.**

   Requirements being established by the BCPE for certificants to maintain their certification (via continuing education credits, participation in professional society activities, etc.) are means for demonstrating commitment to competence and maintaining the integrity of the moral and collegial nature of the ergonomics profession. Although this criterion is

one that often sparks defensive responses from individual ergonomics practitioners, the BCPE is to be commended for its leadership in moving forward in establishing a fair means for meeting this criterion of professionalism.

5. **An ergonomics professional must demonstrate autonomy in practice and judgment and accept the responsibility of self-regulation.**

   This criterion is one that the individual ergonomics professional must satisfy alone.

6. **An ergonomics professional must exhibit a professional spirit which results from associating together people that adhere to a common ideal which puts service above gain, excellence above quantity, self-expression above pecuniary motives, and loyalty above individual advantage (professionals contribute to the advancement of the professional group).**

   Currently, HFES annual meetings serve as the principal forum in which "professionals can contribute to the advancement of the professional group". However, there are other conferences and forums in which this necessary activity is also pursued. It is yet to be determined where (under which professional group) or how the fractionated community (communities) of ergonomics practitioners will join together and "be about our common business."

Paraphrasing a statement referenced earlier about lawyers (ABA, 1995) we can say that a professional ergonomist: "... is an expert in human factors and ergonomics pursuing that learned science in the service of others and in the spirit of public service, and is engaging in these pursuits as part of a common calling to promote excellence in the design of safe, healthy, productive systems for public good. Commitment to these basic values is what makes an ergonomist's work professional."

Recommendations for Action

1. Establish formal relationships with key ergonomics societies and communities to collaboratively develop roadmaps and plans to achieve common goals for professional development of ergonomists.

2. Sponsor presentations and programs on "professionalism" and "meaningful continuing learning, minimum standards of competence and ethics" at major forums in which ergonomics practitioners are present.

3. Sponsor a survey of 250 CPEs and 250 practicing ergonomists who are not BCPE certified to identify similarities and differences in their ergonomics work; use this information to better define needs and opportunities for ergonomics professional development courses and activities.

4. Sponsor an annual forum on "Ergonomics Professionalism" in honor of Dr. David Meister.

5. Encourage the HFES Executive Council and the Annual Meeting Program Committee to include the topic of "professionalism" in every annual meeting program and in other HFES communications and forums. An objective is to focus attention on the need to "operationalize" the words expressed in the HFES strategic plan and code of ethics.

6. Consider the possibility that the HFES may never become the group that endorses professionalization of the human factors and ergonomics discipline (i.e., in the way that the ASLA professionalized landscape architecture, or other groups professionalized their disciplines), and, therefore, develop a plan for addressing that possibility.

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