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## **AC 2012-3051: HEALTHCARE TECHNOLOGY MANAGEMENT: CHANGING THE NAME OF THE FIELD TO IMPROVE AWARENESS**

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# Healthcare Technology Management: Changing the Name of the Field to Improve Awareness

## Introduction

Engineering technology education falls into several discipline-specific areas including electrical, mechanical and construction divisions. In addition to these areas, many institutions offer academic programs designed to train engineering technicians to work in the clinical setting, supporting the safe and effective use of medical equipment. The title of this specialty varies widely, including biomedical engineering technology, biomedical equipment technology, clinical engineering, and bioengineering technology (used by ABET). The lack of a unifying name diminishes career awareness, frustrates educators seeking to collaborate, and hinders student recruitment.

To improve cohesiveness and shared understandings, 30 industry representatives and educators gathered for a two-day retreat in April, 2011, to explore the future of this branch of engineering technology that supports medical equipment involved in patient care. The main goal of the meeting was to identify a discipline name that could be easily understood by members of the public, in contrast to the current widely-varying titles. The group members determined that a unifying name for the discipline should be *healthcare technology management*. This title does not reflect the possible job-level names that may be identified or adapted in the future.

This paper explores opportunities presented as the field seeks to evolve and grow. In addition, the authors discuss the challenges and hurdles faced by this poorly understood academic discipline present within many academic institutions. Lastly, the authors explore the future of the field and existing hurdles and challenges.

## Background

Many technology academic programs throughout the country train graduates who are responsible for managing the selection, maintenance, and safe use of medical equipment. Employed in every hospital in the country, these highly-trained technicians fall under widely varying job titles including biomedical engineering technology, biomedical equipment technology, clinical engineering, and bioengineering technology (used by ABET). In addition, academic program titles vary tremendously.

The content and focus of academic programs varies widely but feature some similarities. Almost all institutions build an academic foundation upon electronics knowledge, problem solving, human anatomy and physiology, medical terminology, and computer systems awareness. The purpose and function of medical equipment used in the treatment of patients is a cornerstone of all curricula. In addition, most programs require an internship within the hospital to build an understanding of the culture of medicine. Some programs require the development of ancillary skills including written and oral communication, mathematics, chemistry and physics.

The Association for the Advancement of Medical Instrumentation (AAMI) is viewed by many members of the discipline as the umbrella organization for the field. The group defines a student

trained by these academic programs as “a biomedical engineering technologist or biomedical equipment technician (BMET) is one who is knowledgeable in the theory of operation, the underlying physiological principles, and the safe clinical application of biomedical equipment.”<sup>1</sup>

Although a less common or understood concentration than electronics, mechanical engineering technology or construction, a recent survey conducted by AAMI found approximately 70 training programs focused on the support of medical equipment in the clinical setting (personal communication, Steve Campbell, June 3, 2011). Programs awarded certificates, associate’s degrees as well as bachelor’s degrees. In addition, the institutional characteristics varied widely. Some colleges were private, some public, some featured regional accreditation, some national accreditation, some for-profit, and some non-profit. This wide variety of program rigor, duration, accreditation, and history presents confusion to both potential students and possible employers.

ABET accreditation is currently held by four academic institutions, DeVry University, Pennsylvania State University New Kensington Campus, Cuyahoga Community College, and Cincinnati State Technical and Community College.<sup>2</sup> Educators involved with programs within the healthcare technology management discipline have wrestled with the influence of ABET accreditation and its importance to the field. To understand the potential disconnect between ABET and academic institutions in this discipline, one can explore the lead society for this academic specialty. ABET describes the lead society role as “to set policy, develop strategy, and conduct ABET accreditation activities worldwide on behalf of their professions.”<sup>3</sup>

The lead society for bioengineering technology (ABET’s term) is the Biomedical Engineering Society (BMES). The mission and focus of that group is identified on their website as “to build and support the biomedical engineering community, locally, nationally and internationally, with activities designed to communicate recent advances, discoveries, and inventions; promote education and professional development; and integrate the perspectives of the academic, medical, governmental, and business sectors.”<sup>4</sup> The most enlightening words in this mission statement include *advances, discoveries, and inventions*. The BMES focus in innovation is misaligned with the main emphasis for healthcare technology management, which supports existing technologies in patient care. Although ABET accreditation would not be well-matched to all institutions in this discipline, clearly only a tiny fraction of the programs seek evaluation by this group. ABET is unlikely to be the guide or vehicle for content cohesiveness or evolution over time for the majority of healthcare technology programs.

Few engineering technology educators are familiar with this specialty. The challenges of a lack of public and academic awareness become acute when educators seek to connect with other engineering technology faculty. For example, the reviewers of this paper submission (presumed to be engineering technology educators) explained that the discipline name is “most appropriate for groups in the pharmaceutical and nursing industries” (ASEE reviewer comments, personal communication, December, 2011). Another reviewer expressed concern that graduates cannot be labeled “technicians.”

Further complicating confusion outside the discipline is the clinical nomenclature used to identify hospital departments. Many groups are titled *biomedical engineering* and their

employees *biomedical engineers*, true even when no staff have engineering degrees. To academic faculty and staff, the support of clinical equipment bears little resemblance to the traditional approach of biomedical engineering educational programs, whose focus explores innovation and design of engineering applications in medicine. While educators have clear definitions of biomedical engineering, AAMI uses the term in almost all of its literature and scholarly publications.

Educators may face hurdles within the technology discipline but graduates find plentiful employment opportunities as health care as an economic sector has remained strong during this financial downturn. King (2010) described a “red-hot profession.”<sup>5</sup> *US News and World Report* discussed the support of clinical equipment in their 2010 article describing the 50 best careers.<sup>6</sup> Educators report excellent graduate placement and increased employer interest. The United States Department of Labor Bureau of Labor Statistics predicted an increase in the need for graduates in the discipline of healthcare technology management will increase 27% by 2018.<sup>7</sup> In a weak economy, these predictions attract students to the small number of academic programs.

### The Problem

The lack of a cohesive and unifying discipline name undermines the academic exchange of ideas, challenges connections to potential employers, and may hinder student recruitment. Educators are challenged to identify and connect with colleagues, to share innovative ideas, and to discuss instructional and technological approaches. Employers too are challenged to identify and connect with educational institutions as a source of potential job candidates. Lastly, potential students are unable to find and evaluate training programs matched to their career objectives. In general, an overarching discipline name would improve the ability for society as a whole to identify and characterize those who support the use of technology in patient care.

### Future Forum Retreat

Thirty industry representatives and educators gathered for a two-day retreat in April, 2011, to explore the future of this branch of engineering technology that supports medical equipment involved in patient care. The group included a broad spectrum of the discipline, including bench technicians and CEOs. The main goal of the meeting was to identify a discipline name that could be easily understood by the public, in contrast to the current widely-varying titles including biomedical engineering technology, biomedical equipment technology, clinical engineering, and bioengineering technology (used by ABET). Following extensive discussion and review of input from an additional 200 people in the field, the group determined that a unifying name for the discipline should be *healthcare technology management*. The conclusion was reached “by viewing past milestones, assessing current trends, and considering future opportunities.”<sup>8</sup> The selected name is designed to encompass the entire field, not the specific job duties of those associated with the discipline. Healthcare technology management will support a “continued focus on safety, risk management, technical support of medical devices and clinical technologies, and financial stewardship.”<sup>8</sup>

The new discipline name is accurate, can be understood by healthcare workers, and facilitates future expansion and long-term growth of responsibilities. The name choice offers educators a

framework for the establishment of a more cohesive curriculum across institutions, improved support from academic administration, and a well-defined career path for our graduates. The change also presents challenges as educators evaluate degree program names currently in use, investigate the perceptions of local industrial and clinical connections, and assess the institutional impact of this nomenclature shift.

### The Future of the Discipline

Industry and clinical employers clamor for high-quality college graduates with degrees in the area of healthcare technology management. The unifying name selection promotes a national discussion of this branch of engineering technology. Connecting educators and improving awareness can increase the number of high quality academic programs focused on healthcare technology.

As the discipline goes forward, educators are working to identify a common set of curricular outcomes to define and harmonize academic programs. This extensive project will offer a set of voluntary guidelines that be used by institutions to develop course content and prepare students for national certification. Combined with an overarching discipline name, hospital and industry employers hope to better evaluate programs and graduates.

<sup>1</sup> Association for the Advancement of Medical Instrumentation (AAMI). (2011). *What is a BMET?* Retrieved from <http://www.aami.org/resources/BMET/whatis.html>

<sup>2</sup> ABET. (2012). *Accredited Programs Search*. Retrieved from <http://main.abet.org/aps/Accreditedprogramsearch.aspx>

<sup>3</sup> ABET. (2012). *ABET Member Societies*. Retrieved from <http://www.abet.org/abet-member-societies/>

<sup>4</sup> BMES. (2012). *About BMES*. Retrieved from <http://www.bmes.org/aws/BMES/pt/sp/mission>

<sup>5</sup> King, R. (2010). Biomedical Engineering Emerging as Red-hot Profession. *Biomedical Instrumentation and Technology*. November/December 2010, Vol. 44, No. 6, pp. 448-449.

<sup>6</sup> US News and World Report (2010). 50 Best Careers of 2010. Retrieved from <http://money.usnews.com/money/careers/articles/2009/12/28/the-50-best-careers-of-2010>

<sup>7</sup> United States Department of Labor Bureau of Labor Statistics. (2010). *Occupational Outlook Handbook*. Retrieved from <http://www.bls.gov/oco/ocos355.htm>

<sup>8</sup> AAMI. (2011). *Forum Participants Move Forward with Name, Vision for Field*. Retrieved from <http://www.aami.org/news/2011/092811.press.future.forum.html>