Are Technologists Qualified to Be Educators?

In this Point/Counterpoint article, the authors have been asked to debate whether nuclear medicine technologists are qualified to be educators. This questions the basis of many of our training programs, in which significant portions of the program are taught by staff technologists. This is true for nuclear medicine technology and medicine as a whole, because the student is an apprentice learning a trade. The authors of our articles are both educators: Mary McCormick Morgan, MS, CNMT is the director of the Nuclear Medicine Technology program at Ohio State University in Columbus, Ohio and Charles H. Coulston, MSEd, CNMT, RT(N) is the director of the Nuclear Medicine Technology Program at Lexington Community College in Lexington, Kentucky. The article is intended to stimulate thought about our educational and training processes. Please address your comments regarding these articles to Beth Harkness, editor of the *Journal of Nuclear Medicine Technology*.

POINT: TECHNOLOGISTS ARE NOT QUALIFIED TO BE EDUCATORS

Are technologists qualified to be educators? In clinical education systems across the nation, it is common for clinics or hospitals to use staff to teach academic courses. Many staff employees feel obligated to take on this role because there is no one else to do it; therefore, a certain amount of ambivalence is understandable. Here, I will describe the qualities and skills of an educator and analyze them to see if it is possible for a staff employee to attain these qualities and skills without formal educational training.

An educator is defined (*1*) as "a teacher; a person distinguished for his or her educational work." Using the same source's definition of health ("the state of fitness of the body or of the mind"), I propose the definition of health care worker to be someone whose work helps others achieve a better state of fitness of the body or of the mind. Upon comparison, it is not apparent that a health care worker would also be an educator. Based on these definitions alone, the 2 professions do not seem to contain a common thread.

I begin this analysis by examining the skills and qualities of the student. Do all students learn alike? Most educators and health care workers would probably agree that this is not the case. Common sense would tell you that, given a random sample of people attempting to learn an idea or skill, the learning would take place in myriad ways.

Realizing that students learn differently, the next question to consider is: What are the different ways a student learns? Most educators would know this answer and are able to identify the types of lectures, discussions, assignments, and assessments that complement different learning styles. Would technologists know these different styles of learning? If they were able to list them, would they know how to facilitate the learning experience by implementing various techniques? Assessing learning style and planning your course accordingly is not a skill that is acquired while working in a health care setting.

In *The Adult Learner on Campus* (*2*), 2 types of learning are described: random learning and planned learning. Random learning is what occurs through the process of living. It is a continual, daily process that is not planned. Planned learning, on the other hand, is deliberate; it is organized and designed (either for us or by us). Education is considered planned learning.

Technologists do not generally plan on being instructors; therefore, it is highly unlikely that they will seek out and acquire the ability to assess learning styles while working in the health care setting. Any skill or ability to teach that they acquire on the job can only come from random learning. However, teaching ability does not come from random learning. A good educator develops his or her teaching skills through years of planned learning.

Another trait of educators is the ability to analyze the student's personality type. It is crucial for educators to understand and apply personality theories in their instruction and planning, so that learning can be maximized for each individual. Would technologists acquire the knowledge of Jung's theory of psychological types (*3*) while on the job? Even if a technologist was aware of Jung's theory, he or she would probably not know how to apply it in a teaching situation. In addition, technologist educators may not have the knowledge or skills necessary to evaluate and react to people of varying personality types.

In reference to the importance of understanding the different personality types of students, Gordon Lawrence (*4*) states, "It is crucial in explaining why certain approaches to instruction or supervision work with some people and not with others." He believes that professionals can use this information to dramatically improve the effectiveness of their work. It is not likely that technologists would be aware of this information or know how to apply it to their instruction or supervision.

The next topic to consider is curriculum. What tools would technologists use to design a curriculum? Would they know that there are different models of curricular design or that there is more to a curriculum then presenting material and giving a test?

A review of Seibert's model for curricular design (*5*) indicates that there are many aspects that would be difficult for a technologist to acquire sufficient knowledge of while on the job. For example, verifying "real world" expecta-

tions. A technologist who is put in a role as an educator is going to consider the real world as his or her own world. The average health care worker would not have sufficient time to analyze other health care settings. It is also reasonable to expect that a technologist does not have the time to analyze the occupation, consult authorities, or do graduate and employer follow-ups. Even after examining the more simplistic Ford model of define, develop, and evaluate (*6*), most technologists could only use it at a minimum level.

This segues into the subject of selection of course materials. What criteria would technologists use when selecting instructional materials for the course? Many technologists who are placed in a role of educator do not have the choice of which instructional materials to use nor do they realize that different materials stimulate different learning. An educator would not let someone else select his or her instructional materials.

Another area of concern involves analysis of instructional strategies. How many different strategies would a technologist know of and which strategies would be used? My observation is that technologists use lecture and patient service for the majority of instruction. They would most likely not know all the different uses and varieties of lecture, discussion, self-instruction, projects, simulation, or programmed instruction. Likewise, it is unrealistic to believe that hospital work prepares technologists to evaluate and use these strategies to achieve program goals or objectives.

Questioning techniques are also a crucial part of learning. Based on my own experience, technologists are unlikely to have the knowledge of different questioning techniques. Considering this ignorance, how would it be possible to develop the student's critical thinking skills through questioning? Would a technologist use closed or open questions in teaching situations? Which subtypes of questions would be most beneficial to achieve the learning outcomes? It has been said many times that questioning is one of the oldest and most important instructional techniques. Is it possible, then, for a technologist to take advantage of the different questioning techniques without any awareness of what these techniques are? I do not believe 20 y of experience in a hospital teaches a person which questioning techniques are available or how to best apply them.

Assessment is an educational tool with which everyone is familiar. Because all of us have been in school and have taken tests, it might be assumed that each of us would know the different styles and formats of assessment available. Technologists who are placed in the role of educator are presumed to have the ability to write effective assessments. It would not be a surprise to discover that the exams currently being used were written for previous classes. However, previously used exams are not going to be a reliable measure of student achievement from one group of students to the next. Are the goals, objectives, and outcomes of the course congruent? Are technologists even aware of the concept of congruency between goals and objectives?

Typically, technologists have neither concrete evidence nor any demonstrated ability to teach, so why are they placed in these roles? If a technologist has been teaching for any number of years in the field, does it mean that individual is knowledgeable about education or that he or she is simply reapplying incorrect methods and techniques year after year? The Committee on Performance Based Teacher Education stresses that we are in an age when accountability is essential. If so, they ask, "Why should we who train teachers not require each and every candidate for certification to demonstrate that he or she can teach something to real pupils and have them learn it?"(*7*) Why is the health care profession not demanding this accountability? Is health care exempt from educational standards?

As stated by Apps (*2*), "It is hardly surprising that a great deal of teaching at both the graduate and undergraduate level is dull and ineffective." Apps also states, "Few graduate programs that prepare college teachers give any attention to the teaching process itself." He believes that one problem is the substitution of laboratory or field experience for teaching experience. That is exactly why health care workers may not be qualified to be educators.

Accoding to Cahn (*8*), the reason for low-level competence among college teachers is the inability of higher education to recognize that intellectual competence is a separate quality from pedagogic competence. If traditional institutions of higher education expect pedagogic competence from their instructors, then why should higher education in health care be any different? Should not students in health-related fields also be able to expect and receive pedagogic competence from their instructors?

In conclusion, it has been easy to demonstrate the many qualities of an educator that are not qualities inherent to health care workers. By definition and demonstration, there are no common threads between health care work and educational skills. Higher education institutions must become accountable for the competence of their instructors. Ten years of experience as a nuclear medicine technologist could not have prepared me to know what I have reflected on in this analysis. Only my courses and research in education have afforded me this specialized knowledge. It is best summarized in a statement by Cahn (*6*): "One cannot be an outstanding teacher without knowledge of subject matter, but to possess that knowledge does not guarantee the ability to communicate it to a student."

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REFERENCES

1. *The New Lexicon Webster's Dictionary*. Rev. ed. New York, NY: Lexicon Publications; 1989.
2. Apps JW. *The Adult Learner on Campus*. Chicago, IL: Follett Publishing Company; 1981.
3. Hammer A, McCaulley M, Myers I, Quenk N. *MBTI Manual: A Guide to the Development and Use of the Myers-Briggs Type Indicator*. 3rd ed. Palo Alto, CA: Consulting Psychologists Press; 1998.

4. Lawrence G. *People Types and Tiger Stripes*. 3rd ed. Gainesville, FL: Center for Applications of Psychological Type; 1996.
5. Seibert, ML. *Formal Teacher Preparation, Job Performance, and Job Satisfaction of Allied Health Educators in Indiana* [dissertation]. Indianapolis, IN: Allied Health Sciences, Indiana University; 1979.
6. Ford C, Morgan M. *Teaching in the Health Professions*. St. Louis, MO: Mosby; 1976.
7. Medley DM, Soar RS, Soar R. *Assessment and Research in Teacher Education: Focus on PBTE*. Washington, DC: American Association of Colleges for Teacher Education; 1975.
8. Cahn SM, ed. *Scholars Who Teach*. Chicago, IL: Nelson-Hall; 1978.

COUNTERPOINT: TECHNOLOGISTS ARE QUALIFIED TO BE EDUCATORS

Nuclear medicine technologists are and must be teachers, regardless of whether we are professionally trained. Who better to transmit the current body of knowledge to the up-and-coming student technologists who will eventually replace us than the working technologists of today? We are the content experts. We are the ones with the hands-on, practical experience. The ability to do the work of a technologist and to expand that "doing" into teaching will produce the next generation of nuclear medicine technologists. True, the working technologist may lack (or, hopefully, only have forgotten) some of the theoretical knowledge base that guides our clinical actions. However, solely understanding why radionuclide imaging is performed or only understanding the purpose of a camera uniformity flood has yet to produce an image for interpretation or a flood for analysis. Of course, this is not to negate the value of understanding, only to reject the idea of valuing it to the exclusion of also "doing." Ideally, a balance between understanding and doing can be achieved, but to argue that only professional educators can accomplish this is to support an unbalanced and unreasonably extreme point of view. This need for balance is the rationalization I use to maintain my ties to a local hospital department as an occasional staff member in addition to being a professional educator. For this reason, too, my clinical experiences are new and fresh.

The analogy of the working technologist as teacher is that of the college professor whose educational career and professional life are focused on study and work in a specialized area. Often, these highly specialized individuals begin to teach others without a thought about how many education courses they should have taken or how many hours of student teaching they should have experienced. Nuclear medicine technologists are frequently in a similar situation. We learn a highly specialized field and then find ourselves in a teaching situation without the benefit of also preparing to become teachers. Being the expert of a body of knowledge does not necessarily guarantee the quality of instruction. Unfortunately, this part of the analogy sometimes extends to technologists teaching students.

Drawing on personal experience and the experiences of colleagues where I teach, neither I nor any of the health technology faculty began teaching with a professional background in education. We were an enthusiastic, self-selected lot who wanted to give teaching a try and, for one reason or another, were selected by the college for this role. We found ourselves in front of classrooms of people who wanted to learn how to do the things we had practiced as a career. Over the years, students have taught me that enthusiasm (combined with a modicum of ability) will carry an individual a long way towards a goal. I believe this holds true for those of us who want to teach, who have the appropriate experience, and who have some ability or talent in that direction but lack teaching credentials. Although it is not intended to be as cynical as it sounds, I have encouraged new faculty members who were unsure of their classroom abilities by reminding them that on the worst class days, they know more nuclear medicine technology from their experience than all the students combined on their best day. The real work is to find the way to transmit this experience and knowledge. I say this because I believe that experience is an excellent teacher, and it is this same experience the working technologist has to offer to the student.

Initially, my colleagues and I taught the curriculum content of our various programs anywhere without the benefit of professional educational instruction before returning to the university to become professional educators. In that period of time, our students graduated from our programs, successfully passed certification examinations, and went on to work in technical capacities. Has the situation improved or changed since my colleagues and I went to graduate school? Yes and no. Thanks to a few particular courses, we believe our instructional skills in the classroom have improved. We gained some tools to help us teach with more focus, to better organize course content, to better correlate examinations to the curriculum, and to make decisions about curriculum. However, in some ways, the situation has not changed. The students still graduate from the programs, pass the certifying examinations, and proceed to seek employment to demonstrate what they have learned in the programs (and, of course, to earn a living).

I think it would be helpful to define "professional educator" because the term could mean different things to different people. I began by saying that every nuclear medicine technologist must be a teacher. But is there a difference between being a teacher and being a professional educator? As it turns out, they are not necessarily synonymous. The vast majority would assume that enrollment in a graduate education program would result in a better, more professional teacher. What I learned to become a professional educator was different than what I expected. I discovered well into my graduate program that I was being taught to be a professional research educator rather than a professional teacher. In my naivete, I believed enrolling in graduate school would make me a better instructor. To my confusion, I found only 3 of 12 courses to be directly related to teaching methods. The rest were interesting to one degree or another, but not very useful in helping me understand how to teach. Was this really going to help my students or the curriculum? I recommend that anyone who is contemplating a career change into education investigate the purpose of the curriculum of any program that leads to a degree in educa-

tion. There is a large gap between the graduate (research) curriculum that I experienced and the professional curriculum that I wanted. I found teaching skills to be a well-kept secret in the college of education that I attended.

Nevertheless, nuclear medicine technology and every other technical, skilled profession rely to a great extent on the concept of experiential education, whether it is called clinical experience, practicum, internship, apprenticeship, clerkship, or residency. The application of learning must, at some point, intersect with the activity from the classroom. Students who want to become technologists must enter a nuclear medicine department to have the opportunity to observe, assist, and perform imaging procedures. Nothing that a professional educator devises will ever replace the real-life experiences of a student placing his or her hands on a patient or a camera. As nebulous and unstructured as it may appear when compared to the classroom, participating in the day-to-day swirl of activities of a nuclear medicine department is the best way for a student technologist to begin to grasp the scope of duties and responsibilities. That is where the working technologist becomes the educator, prepared or not. The student will learn lessons of application that must cross the boundaries of the classroom and textbook. And it is there, in the clinical setting, that the professional educator releases a significant degree of control over the students' experiences.

Finally, I agree with a colleague who said that the professional educator is important but not necessary. Clinical education in the form of on-the-job training was conducted long before educators placed their stamp of professionalism on it. With the advent of educational programs, on-the-job training was focused and formalized to become clinical experience packaged as a course. It will continue in both ideal and less-than-ideal situations because educational programs depend on the goodwill of technologists who have not pursued teaching as a first profession. The best that professional educators can accomplish is to organize and provide for an educational setting that facilitates the ease with which students organize and accumulate knowledge and skill. The working technologist (a.k.a., the nonprofessional teacher—but educator, nonetheless) will continue to augment whatever is done in the classroom to the greater benefit of the student.

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