

Model for Ability-Based Assessment in Physical Therapy Education

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ABSTRACT: An ability-based assessment program was developed to facilitate the transition of physical therapy students from classroom to clinic. Generic abilities critically important to physical therapy practice were identified by surveying selected clinical educators using the delphi technique. Evaluation criteria then were developed to define behaviors representing competence in each generic ability. Formal introduction of the program into the curriculum occurred in the fall of 1993. Exercises were developed to assess progress and to provide immediate feedback to students throughout the professional curriculum. Based on feedback from students and clinicians, we believe that we have developed an assessment program critically important to physical therapy practice. Ability-based assessment does not replace knowledge and skill-acquisition assessment. It complements these more traditional assessment forms in helping students develop the repertoire of behaviors essential for clinical success.

INTRODUCTION

Transition from the classroom to the clinic is one of the most challenging experiences faced by physical therapy students. When the University of Wisconsin-Madison physical therapy faculty questioned clinical instructors about why some students fail to make this transition smoothly, lack of knowledge or inadequate psychomotor skills were rarely implicated. Instead, difficulty often arose from underdevelopment of certain professional behaviors that facilitate the use of knowledge and psychomotor skills in the clinical set-

ting.¹ These behaviors reflect abilities that often are modeled by faculty rather than taught explicitly in the curriculum.²

Many clinical instructors associated with our program have alluded to these professional behaviors, such as effective communication, time management, and responsibility, when they provided narrative evaluations of students. They have expressed frustration that the existing evaluation tool does not provide the structure to assess these more universal or "generic" abilities as well as it does professional knowledge and technical skills. They also have reported difficulty in assessing these behaviors in their narrative evaluations.

To bridge this gap, the physical therapy faculty at the University of Wisconsin-Madison embarked on a program to identify important generic abilities for physical therapy graduates and to establish behavioral criteria by which to measure them. The approach we chose was ability-based assessment, a program developed at Alverno College in Milwaukee, Wis, during the 1970s.¹

We first became aware of ability-based assessment through interaction with members of the University of Wisconsin Medical School faculty who have been involved in an ability-based assessment program since 1988.^{3,4} Using the medical school experience as a template, we adopted an approach that would identify and assess professional behaviors essential to developing competency as a physical therapist. The ultimate goal of this project is to incorporate into the didactic curriculum many opportunities for students to practice and perfect these abilities, thereby facilitating their transition to the clinical setting.

Ability-Based Assessment

Ability-based assessment involves multidimensional observation and appraisal, based on explicit behavioral criteria, of the individual learner in action. This concept evolved from the recognition by educators in medicine, law, pharmacy, veterinary medicine, optometry, and the liberal arts that, in addition

to a core of knowledge and skills, a repertoire of behaviors is required for success in any given profession. Mastery of this repertoire of behaviors facilitates the ability to (1) generalize from one context to another; (2) integrate information from different sources; (3) apply knowledge and skills in the practice setting; (4) synthesize cognitive, affective, and psychomotor behaviors; and (5) interact effectively with clients, families, the community, and other professionals.¹

Ability-based assessment has as its foundation the identification of generic abilities expected of entry-level practitioners. Generic abilities are attributes, characteristics, or behaviors that are not explicitly part of a profession's core of knowledge and technical skills but nevertheless are required for success in that profession. These abilities must be systematically developed, have explicit behavioral criteria, be reinforced, and be practiced and assessed at varying levels of complexity.³

Ability-based assessment provides information about the student's ability to analyze and apply information, whereas more traditional formats (eg, multiple choice, fill in the blank, true-false) assess only recall or recognition of information.⁵ Ability-based assessment provides the student with clear guidelines about instructor expectations⁶ and reflects real-life situations.⁷ Assessment is considered an integral part of the learning experience. Explicit criteria and timely feedback help students develop the ability to self-assess, self-correct, and self-direct their own development.

Reliability and Validity

The reliability and validity of ability-based assessment has been studied by several researchers. Studies have demonstrated interrater reliability of content-specific assessments.^{5,8} In addition, several studies have found the interrater reliability of ability-based assessments to be high.⁵ Establishing the validity of ability-based assessment is more difficult. Although performance assessments are considered to have strong face

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Figure 1.

Generic abilities important to physical therapy listed in rank order.

Generic Ability	Definition
1. Commitment to learning	The ability to self-assess, self-correct, and self-direct; to identify needs and sources of learning; and to continually seek new knowledge and understanding.
2. Interpersonal skills	The ability to interact effectively with patients, families, colleagues, other health care professionals, and the community and to deal effectively with cultural and ethnic diversity issues.
3. Communication skills	The ability to communicate effectively (ie, speaking, body language, reading, writing, listening) for varied audiences and purposes.
4. Effective use of time and resources	The ability to obtain the maximum benefit from a minimum investment of time and resources.
5. Use of constructive feedback	The ability to identify sources of and seek out feedback and to effectively use and provide feedback for improving personal interaction.
6. Problem solving	The ability to recognize and define problems, analyze data, develop and implement solutions, and evaluate outcomes.
7. Professionalism	The ability to exhibit appropriate professional conduct and to represent the profession effectively.
8. Responsibility	The ability to fulfill commitments and to be accountable for actions and outcomes.
9. Critical thinking	The ability to question logically; to identify, generate, and evaluate elements of logical argument; to recognize and differentiate facts, illusions, assumptions, and hidden assumptions; and to distinguish the relevant from the irrelevant.
10. Stress management	The ability to identify sources of stress and to develop effective coping behaviors.

Figure 2.

Behavioral criteria for generic ability 1: Commitment to learning.

Beginning Level Identifies problems Formulates appropriate questions Identifies own needs based on life experiences Identifies and locates appropriate resources Demonstrates positive attitude (motivation) toward learning Sets personal and professional goals Offers own thoughts and ideas Identifies need for further information
Developing Level Prioritizes information needs Takes collaborative approach Analyzes and subdivides large questions into components Monitors own progress Initiates own learning projects Accepts learning as a lifelong process Accepts that there may be more than one answer to a problem Recognizes the need to and can verify solutions to problems Meets all beginning-level criteria
Advanced Level Questions conventional wisdom Responds appropriately to unexpected or entirely new experiences Reconciles conflicting information Seeks additional learning opportunities Applies new information and reevaluates performance Formulates and reevaluates position based on available evidence Plans and presents in-service program during clinical internship Meets all beginning- and developing-level criteria

validity, which means that the assessment appears to measure what it is supposed to, some researchers warn that face validity is not sufficient.⁹ Gathering evidence to confirm that ability-based assessments do in fact measure performance is quite difficult.⁵ Therefore, more research is needed to determine the validity of ability-based assessment.

METHOD

Identifying Generic Abilities

A rank-ordered list of generic abilities deemed important for physical therapy graduates was generated based on input from a subset of clinical instructors associated with our program. The delphi technique¹⁰ of soliciting and collapsing responses until consensus is achieved was used to develop the list of abilities. Selection criteria for sampling of clinical sites were (1) the clinical site had been affiliated with our program for at least the past 3 years and (2) the clinical site offered both short- and long-term clinical experiences. In addition, a few clinical sites were chosen because clinicians who had supervised our students for many years had recently relocated to that facility. Both small and large clinical sites across the country were represented. Eighty of the program's 200 clinical sites met the criteria and were surveyed in April 1991. Clinical educators from 76 clinical sites responded and identified the abilities they expected of physical therapy graduates. The responses were collapsed, and the refined list was returned to the clinical sites for comments, additions, and ranking. Consensus was achieved after four mailings. Ten generic abilities emerged from the survey of clinical sites as the most important abilities for graduates to possess (Fig. 1).

Developing Evaluative Behavioral Criteria

We then developed behavioral criteria to provide specific standards by which each generic ability could be assessed. The purpose of the criteria was to define behaviors representative of a given level of competence. Three progressively sequenced levels of complexity for each ability were chosen because attainment of competence in generic abilities is developmental: each level includes criteria from the previous level(s) *in toto* or in summary.¹¹

Using the nominal group process¹⁰ to brainstorm ideas, Madison-area clinicians and University of Wisconsin-Madison physical therapy faculty and students began to develop evaluative behavioral criteria in April 1992. A few months later, clinicians at the 76

participating clinical education sites were contacted again and were asked to respond to the criteria that had been developed. They also were asked to categorize each criterion into one of three levels based on complexity:

1. Beginning—behaviors students should demonstrate by the end of the first year of their professional education.
2. Developing—behaviors students should demonstrate by the end of the second year of their professional education.
3. Advanced—behaviors students should demonstrate by the end of their clinical internships.

The delphi technique was used again, and two mailings were required to reach consensus. Although it is not our intention to have a set number of criteria for each level, we expect that as they are refined, four to six representative criteria will emerge as sufficient to determine competency. Figure 2 lists the behavioral criteria for one generic ability, commitment to learning.

The relationship of the three levels to the divisions of the professional program provides the opportunity to assess overall progress towards entry-level competence at key points in the curriculum. In addition to providing standards to assess the level of competency in each generic ability, the criteria can be used by students to direct their efforts to improve. As the program of ability-based assessment develops, we will determine whether students will be required to exhibit competence at the developing level in each generic ability in addition to completing all didactic courses before starting the 18-week clinical internship.

IMPLEMENTATION AND EVALUATION

Ability-based assessment was formally introduced into the University of Wisconsin-Madison physical therapy curriculum in the fall of 1993. During the orientation session for the incoming class in August 1993, the concept of ability-based assessment was explained, and a description was provided in the student handbook. It was stressed that the 10 generic abilities were developed and are valued by clinicians with whom students will be working and that they represent the values and expectations of both clinical and academic faculty. Students in the second year of the professional program were oriented to ability-based assessment and to how it would affect them during their final two semesters and their clinical internships.

Each academic faculty member is responsible for developing assessment exercises for abilities that are appropriate for his or her

Figure 3.

Checklist for rating three generic abilities.

Generic Ability	Behavioral Criteria	Rating	
		Yes/No	Comments
Use of constructive feedback	<ol style="list-style-type: none"> 1. Presenter is receptive and nondefensive to constructive remarks 2. Presenter actively seeks feedback and help 3. Presenter critiques his or her own performance 		
Communication skills (speaking)	<ol style="list-style-type: none"> 1. Appropriate English 2. Appropriate body language, poised, good posture 3. Appropriate eye contact 		
Problem solving	<ol style="list-style-type: none"> 1. Correct treatment rationale 2. Treatment based on data and goals 3. Treatment rationale well explained 4. Treatment logically sequenced 		

courses. The goal is to provide multiple assessment settings for each ability. The following example illustrates how one faculty member incorporated an assessment exercise into her therapeutic exercise course. Students, working in pairs, designed a treatment program for a hypothetical patient, presented the program to classmates and instructors, demonstrated treatment techniques, and responded to questions and comments from the audience. Two instructors and five randomly selected students assessed the generic abilities of communication skills, problem solving, and use of constructive feedback based on behavioral criteria that had been established for each generic ability. Figure 3 lists the criteria for assessing these three generic abilities. To provide assessment in a different context, another faculty member assessed these same abilities during a practical examination.

Evaluating Effectiveness

Introducing ability-based assessment at the beginning of the professional program provides early identification of behaviors requiring development. Students then have ample time in a supportive environment to develop the behaviors required for demonstrating competence in a given ability. Allowing time to practice and receive feedback from faculty and other students is the key to developing competency in the 10 generic abilities. The expected outcome is that students will use their clinical internship experiences to refine abilities that are fairly well developed.

To evaluate the effectiveness of this program, students in the class of 1993 (who had not participated in ability-based assessment) rated their own levels of competency

in each generic ability before and after their 18-week clinical internship. Their clinical instructors in their final clinical rotation also rated them. The following scale was used for ratings by students and clinical instructors: 1=rarely, if ever, demonstrates ability; 2=demonstrates occasionally, needs substantial improvement; 3=not entry-level but making steady progress; 4=entry-level, demonstrates consistently; and 5=exceeds entry-level competency. These ratings will be used as a baseline for assessing the competency outcomes of future students.

Students in the class of 1994 were the first group required to demonstrate advanced-level competency in each generic ability to receive credit for their clinical internships. Clinical instructors were asked to use the generic ability as a basis for their narrative evaluations at midterm and at the end of each 6- or 9-week rotation and to complete a rating form (Fig. 4.). This process will be evaluated and refined, and its reliability and validity will be studied.

DISCUSSION

Ability-based assessment differs from knowledge-acquisition assessment in at least two ways: the timeliness of feedback and the context in which feedback is provided. Feedback with knowledge-acquisition assessment is delayed because of the time interval required for scoring the examination, and assessment can occur only in the context of classroom or laboratory examinations. Feedback in ability-based assessment is provided immediately after the assessment, is structured, and may occur in a variety of classroom, laboratory, or clinical settings.

Because of its focus on behavior, ability-based assessment does not replace, but rather complements, traditional knowledge-acquisition assessment. This focus provides more diversity in assessing learning fully and fairly and makes assessment an integral part of the instructional process.¹² Whereas knowledge-acquisition-based systems of teaching assessment cultivate the student's ability to recall detailed information, ability-based systems develop the processes of seeking, integrating, and applying knowledge—all of which are essential to function optimally in the health care system.¹³ In addition, ability-based assessment provides both formative and summative assessment, informing students of their performance relative to expected standards and directing their efforts to improve that performance.

A potential disadvantage of ability-based assessment is that it requires significant changes in instructional practices. For example, instructors must focus their instruction on outcome performance rather than on the content of standard achievement tests. There is evidence that implementation of ability-based assessment requires such changes¹⁴ and that without adequate changes in instructional practice, improvement in student learning cannot be expected. Thus significant improvements in educational outcomes may hinge not only on embracing the concept of ability-based assessment but also on providing faculty with appropriate professional development opportunities to facilitate successful implementation of this concept.¹⁵

The generic abilities and associated behavioral criteria presented here are, to our knowledge, the first of their kind derived specifically for the physical therapy profession. Based on feedback from students and clinicians, we believe that we have developed an assessment program critically important to the practice of physical therapy. We are confident that our graduates will be better prepared as a result of their participation in this program.

CONCLUSION

Transition from the classroom to the clinic often is hindered by underdevelopment of generic abilities that facilitate the use of knowledge and psychomotor skills in the clinical setting. The clinical and academic faculty of the University of Wisconsin-Madison Physical Therapy Program identified abilities critically important to the practice of physical therapy and implemented a program to assess those abilities through assessment of specific behavioral criteria. These generic abilities and their behavioral criteria reflect our values and expectations.

Other physical therapy programs have expressed an interest in ability-based assessment and have used our list of abilities and criteria, modified our list to suit their needs, or are developing their own abilities and criteria reflecting their values and expectations. Several clinical facilities also are using generic abilities as a basis for staff-performance appraisal. As we continue to develop and expand our program of ability-based assessment of generic abilities, we are encouraged by the support and affirmation of our academic and clinical colleagues. Ability-based assessment will not replace standard written and practical examinations, but it can be used in conjunction with them to help students develop the repertoire of behaviors essential for success as a physical therapist.

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Figure 4.
Generic abilities assessment rating form.

Student _____

Listed below are generic abilities that have been identified by clinicians as being essential for the entry-level physical therapist to possess. Please assess each ability according to the behavioral criteria in the packet provided by the Intern. The criteria provide examples of behaviors required to verify competence at a given level. It is not necessary to demonstrate all of the criteria at a given level. Please comment on any rating assessed below the Advanced Level - use reverse side if necessary.

Ability	Level		
	Beginning	Developing	Advanced
1. Commitment to Learning			
2. Interpersonal Skills			
3. Communication Skills			
4. Effective Use of Time and Resources			
5. Use of Constructive Feedback			
6. Problem-Solving			
7. Professionalism			
8. Responsibility			
9. Critical Thinking			
10. Stress Management			

Comments: _____

Clinical Instructor _____ Date _____
 Facility _____ Rotation # _____