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The "A" Word

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The "A" Word

No, I am not referring to the most obvious "A" word (i.e., *aquatics*). As I promised regular readers of my editorial in the last issue, this editorial focuses on a different "A" word: *assessment*. Assessment, defined by Palomba and Banta (1999) as "the systematic collection, review, and use of information about educational programs for the purpose of improving student learning and development" (p. 4), certainly seems to hold negative connotations among both instructors and students, at least in higher education (e.g., an inside joke among members of BGSU's Student Achievement Assessment Committee is that we have to disguise the committee's purpose by only referring to "the A word" in public). I wonder if part of the negativity toward assessment stems from an original meaning of *assess,* which is "to set or fix a certain sum against, as a tax, fine, or special payment" (McKechnie, 1983). Nobody likes taxes; therefore nobody likes assessment. More interestingly, the word actually can be traced all the way back to the Latin *assidere,* "to sit alongside." To me, the latter meaning connotes a kinder, gentler image for assessment of a supportive teacher sitting down next to a learner as she provides positive, constructive feedback and encouragement while promoting that student's learning.

Where's the Beef?

For quite some time I have realized that one of the weakest parts of most of our swimming instructional programs is the lack of valid, reliable, and objective assessment instruments with which to measure and evaluate swimming achievements and accomplishments. As I have shared in previous editorials, in addition to motor development I studied measurement and evaluation (probably a better label than *assessment*) in graduate school. Now I serve as the instructor for our BGSU kinesiology courses in measurement and evaluation of human movement and physical activity. While teaching this course for over 25 years, I have discovered that, regardless of what measurement text I have consulted, there was a paucity of available independent swimming-assessment instruments in the literature. For example, in the past 30–40 years, the primary journal for physical education, sport, and exercise, *Research Quarterly for Exercise and Sport,* has published only a single study testing the validity of a proposed swimming test (Jackson, Jackson, & Frankiewicz, 1979). In addition, this "test" is only appropriate for relatively skillful swimmers already capable of swimming continually for 12 minutes, and it is intended to measure swimming endurance, not skillfulness.

As I reflect on my original training as a water safety instructor (W.S.I.) over 40 years ago, I realize that the Red Cross's W.S.I. program at that point never actually distinguished between the "teaching" of swimming and "assessing" swimming skills. These practices were conceived of and administered as one and the same thing: What you assessed was basically exactly what you taught. Certainly no mention was ever made in the W.S.I. class or text about the three key measurement

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principles—validity, reliability, and objectivity—that ought to be associated with any kind of test items used to assess swimming.

Exemplar Instructional Models

I make the perhaps too subtle distinction of separating the processes of teaching and assessment because I have in mind two instructional models that illustrate how we should conceive of promoting learning, whether the learning environment is a classroom, a gymnasium, or a pool. At the risk of seeming somewhat self-promoting, the first model I have in mind is called the 4-P instructional model and was published in Larry Bruya's and my text, *Aquatic Readiness* (Langendorfer & Bruya, 1995). As the reader can see in Figure 1, we conceived of the instructional process as being composed of four interrelated and iterative elements. Instruction should begin with a formal or informal "pretest," the results of which then inform the instructor's planning and then his or her presentation to the learner. Larry purposefully chose the term *presentation* (besides the fact that it alliterated with our other three terms) to emphasize that we can facilitate learning using a variety of direct and indirect instructional strategies, some of which do not resemble the traditional, and most common, "command" style teaching (which I like to call "tell, show, and do"). Finally, the circle of interaction promoting learning wraps up with a "postassessment" process designed to determine whether the previous Ps (planning and presentation) resulted in the desired learning. According to our 4-P model, assessment (or measurement and evaluation) should occur twice in the instructional process, both before and after, as well as separate from any "teaching" activity.

The second instructional model, which has some similarities to the 4-P model, is L. Dee Fink's model of integrated course design (Fink, 2003). As the reader can observe in Figure 2, Fink proposes that there are four primary components in any learning setting (a.k.a., a course). He argues convincingly that instructors must make sure these elements all interact in a balanced and integrated fashion. Even though Fink proposes his model for designing courses that occur in college classroom environments, I think it is just as applicable to swimming courses and
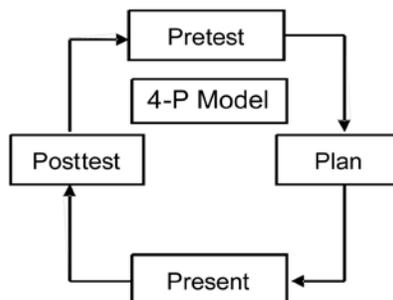

Figure 1 — The 4-P instructional model. Adapted from Langendorfer and Bruya (1995).
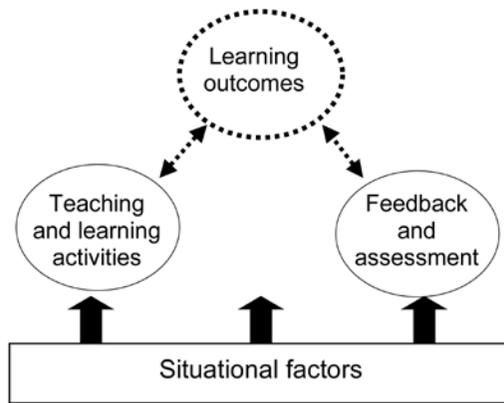
Figure 2 — L. Dee Fink's model of integrated course design. Adapted from Fink (2003).

aquatic settings. According to Fink, after considering "situational variables" (e.g., level of the course, number and experience of students, size and depth of swimming areas), instructors should very clearly identify the student-learning outcomes expected at the end of the instructional unit (e.g., on successful completion of the swimming class, a student will swim on the front). In order to establish the degree to which students achieve the learning outcomes, Fink stresses that assessment and feedback elements must be carefully designed and linked directly back to the learning outcomes. From Fink's perspective, a valid and reliable test should provide students with information about how well they are doing, especially as they are working on achieving the outcome, not just whether they have "passed" or not. Finally, as the means to help students achieve the carefully stated learning outcomes, the final element that completes the model is the careful design of teaching and learning activities. Each learning activity, while obviously considering the specific assessment and feedback mechanisms, should actively and progressively promote achievement of the learning outcome. For prone swimming, teaching and learning activities might include front floating, gliding, kicking gliding, dog paddling, and other front-stroke drills. A single learning activity for achieving any significant learning outcome would not simply consist of requiring learners to swim whatever the criterion distance is.

Three Measurement Principles for Aquatics

When I think back to the old American Red Cross beginner swimming program (American Red Cross, 1968), one skill taught (which simultaneously served as a beginner "test item") was breath holding for 10 seconds. To achieve this skill, we new instructors were told to have prospective beginners try to put their faces and heads underwater for progressively longer and longer periods of time. There was no suggestion that we should come up with a variety of interesting and progressively

challenging learning activities to help each child learn how to submerge her head and then hold her breath. We simply were supposed to assess the skill as we taught it: Tell the student to put her head in the water until we counted to 10. When or if a student finally managed to keep her face in the water for 10 seconds, even once, she was considered to have "passed" that item.

Test Validity

The problem with the 10-second breath-holding skill (as well as many other of the old beginner skills) as a test item is that no one ever bothered to establish whether holding one's breath is actually a *valid* (i.e., accurate and representative) way to measure beginning swimming skill. In other words, someone (or some agency) should have asked the basic question of whether people could be classified as beginner swimmers without being able to hold their breath for 10 seconds, or, conversely, did holding one's breath underwater for 10 seconds automatically qualify a person to be a beginner swimmer? In fact, a master's study at Kent State University (Harrod, 1987; Harrod & Langendorfer, 1988) demonstrated that probably the skill of 10-second breath holding did not have particularly strong validity as a test item for evaluating skill at the beginner swimming level. Others have suggested that it is *breath control,* not breath holding, that is a more valid concept for measuring beginning swimming skill.

Test Reliability

In addition, I know of no evidence that a test item such as 10-second breath holding is necessarily a *reliable* (i.e., consistent and repeatable) way to measure this aspect of beginning swimming skill. To my knowledge, no one has ever taken the relatively simple step of testing how consistently a group of individuals can perform a swimming skill on two separate occasions (e.g., trials, days). For example, if we test a group of children holding their breath, would each child hold her or his breath a similar length of time on a second day or even on a second trial the same day? The fact that swimming instructors apparently have never even documented such a simple test–retest reliability seems to me to be another indication that as a group we either undervalue or simply ignore how important the assessment process is.

Rater Objectivity

A third measurement principle that rarely seems to have been considered in aquatics is the degree of inter- and intrainstructor *objectivity* (sometimes also called rater reliability). Rater objectivity is the degree to which two or more test scorers (in the case of swimming, probably W.S.I.s) are able to agree on the scores achieved by performers. As a source of test error, lack of perfect rater objectivity can have a significant impact on test scores. In the example of a 10-second breath-holding test item, if one instructor used one procedure for testing breath holding (e.g., saying, "Ready, set, go!" and starting to keep time on "Go!" whether the swimmers had submerged or not at that moment) while another instructor used a different procedure (e.g., waiting until swimmers actually submerged before starting the watch), there could easily be a difference of several seconds in the results.

Lack of rater objectivity can produce even more diverse and variable test scores when a qualitative assessment is required (e.g., evaluating whether a student is performing a skill according to certain specifications). I personally have witnessed incredibly diverse interpretations of evaluation rubrics for such swimming skills as a front float (e.g., does it count if the swimmer's arms are stretched overhead or if he or she holds them at the sides? What if the swimmer is not perfectly still, wiggling or kicking the legs?).

I realize that this editorial may sound fairly pedantic and theoretical, at least if the verbal, as well as written, feedback I get from physical education students in my measurement and evaluation course is any indication. I imagine, like my students, at least some readers are thinking, "Who needs all this stuff anyway? I just want to teach swimming." I guess the question is how well do we want to teach swimming and with what kind of sound theoretical assessment basis. As I have argued previously, I feel strongly that all aquatic researchers and professionals alike ought to be striving to elevate our practices in the field of aquatics along with improving our research. It seems to me that one way is to base our teaching, like our research, on the best information available.

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In Volume 1, Issue 4

In this final issue of *IJARE*'s first volume, readers will find for the first time two unique contributions, a position statement (which appears in the Education section) and the first annual World Drowning Report, both submitted by the International Life Saving Federation and its representatives. *IJARE* welcomes the opportunity to publish such official position statements and reports as a public service to the aquatic agencies and our readership. This practice follows one of the stated purposes of *IJARE* to serve as a worldwide forum for the dissemination and discussion of

important aquatic information and issues. Please read and consider the implications and recommendations associated with both the ILS position statement, "Swimming and Water Safety Education," and the 2007 World Drowning Report.

In addition to the special contributions, we are proud to present a set of five very interesting research-based aquatic articles. The first article, a pilot study that examined the effects of aquatic therapy on hip-joint replacements, was authored by Ilanit Weigenfeld-Lahav, Yeshayahu Hutzler, Dana Roth, and Merav Hadar-Frumer from Beit Issie Shapiro and Zinman College in Israel. The next research article, another pilot study, authored by Robert Wendling, Hans Vogelsong, Karl Wuensch, and Anthony Ammirati from East Carolina University, compares lifeguard perceptions about the locations and likelihood of drowning incidents with actual locations and frequencies. Continuing with the lifeguarding theme, the third research article comes to us from Porto, Portugal (site of the September 2007 World Water Safety Congress). The authors, Arturo Abraldes, Susana Soares, Antônio Barroso Lima, Ricardo Jorge Fernandes, and João Paulo Vilas-Boas, examined the efficacy of using fins as standard lifesaving rescue equipment (and I certainly found that their data made a compelling case for the advantages of lifeguards' using fins when performing water rescues).

Richard Hsaio, a professor from Indiana University of Pennsylvania, presents the fourth research article, in which he has surveyed and analyzed the risk management practices and other legal issues associated with college aquatic programs and facilities in Taiwan. Finally, our fifth research study, by a research group (Cristine Alberton, Mabel Olkoski, Stéphanie Pinto, Márcio Becker, and Luiz Kruel) from the Exercise Research Laboratory at the Federal University of Rio Grande do Sul in Brazil, examines how postmenopausal women's cardiorespiratory variables respond to water exercise when they carefully controlled exercise tempo and degree of submersion. We wrap up this final issue of our first volume of *IJARE* with a media review that I provide on the third edition of a classic swimming instructional text, Dave Thomas's *Swimming: Steps for Success*.

I hope you will continue to find the diversity and quality of the articles in this fourth issue as interesting and educational as the previous issues have been. Again, I welcome comments, letters to the editor, and responses to any of our articles and editorials. I remind you to carefully read the position statement and the World Drowning Report, and feel free to offer written responses to them. We will willingly publish appropriate responses and reactions to reports, research studies, educational or professional articles, or even these editorials. Thank you for all your support in putting out this first full volume of *IJARE*.

Stephen J. Langendorfer
Editor