APPLICATION
Have you noticed when you are first learning a skill, such as the serve in tennis, the hook in bowling, or a jump in ballet, that you must think about some very specific aspects of the skill, which differ from what you think about after you have become rather proficient at performing that skill? When you are first learning the tennis serve, you are very concerned with how you are holding the racket, how high you are tossing the ball, whether you are transferring your weight properly at contact, and so on. These fundamental elements of the serve are very important when you are first learning the serve. However, when you practice the serve and improve, these concerns seem less important; you become more familiar with serving and you improve your own serving skill. After much practice, you notice that you concentrate on other aspects of serving. Although you still concentrate on looking at the ball while tossing it and during contact, you also find that you are thinking about where you are going to place this serve in your opponent's service court. Consider novice basketball players. If you put them in a one-on-one situation, you will observe that most of what they are thinking about is the basic mechanics of the fundamental skills involved. They are probably very concerned with dribbling the ball properly because they do not want to lose it to the opponent. Or they attend to the basic mechanics of shooting a lay-up. These concerns predominate. This is quite different from highly skilled basketball players. Highly skilled performers do not direct attention to the mechanics of dribbling or shooting, since these skills are already mastered. Rather, concentration is centered on how to maneuver around the opponent. They may be watching for specific cues from the opponent's movements that will let them know exactly how to move to make a shot. Since skilled players do not have to concentrate on the dribbling or shooting mechanics of the task, they are free to direct attention to other concerns. Both these situations typify phases that occur during the process of learning a motor skill. As practice continues, under proper conditions, certain changes take place in the learner. These modifications can be noted in terms of what the learner thinks about or concentrates on during the performance of the skill. These changes will also be evident in certain characteristics of the individual's performance. In the discussion that follows we will consider these developments more specifically by discussing the stages or phases of learning that have been identified by certain theorists to describe the learning process.

DISCUSSION
One characteristic of motor skill learning is that it is possible to identify distinct stages or phases that all learners seem to experience as they learn skills through practice. Several attempts have been made by researchers to identify these stages to assist us in better understanding the learning process. Three of these proposals to identify the stages of learning will be presented here. Each view purports that the earliest stage of learning is predominated by cognitive concerns about a skill although later the focus shifts to more automatic performance of the skill. The first approach we will consider was developed by Paul Fitts and Michael Posner in 1967 and is traditionally accepted as the classic stage of learning model. This model is commonly referred to in the motor learning literature when stages of learning are being addressed. The other two learning stages proposals have been published since the Fitts and Posner model was proposed and have some unique features that are interesting to consider. One model was developed by Jack Adams as a part of this theory of motor learning, which will be discussed on Concept 2.3. The other model was proposed by Ann Gentile in a monograph in Quest in 1972 and, of the three, is the most closely related to motor skill instruction applications.

FITTS AND POSNER'S THREE-STAGE MODEL
When learners begin to acquire a new skill, they are generally confronted with some very specific, cognitively oriented problems. What is the basic task? How do you score in this game? How do you know who wins? What is out of bounds? What is the best way to hold this racket, or bat, or club, etc.? Each of these questions indicates the basic and cognitive level at which the new learner is operating in the early part of learning a new motor skill. To account for this cognitive activity, Fitts and Posner labeled the first
stage of learning the cognitive stage. This stage is marked by a large number of errors in performance, and the nature of the errors being committed tends to be gross. For example, the beginning golf student gets the ball in the air sometimes, while dribbling it on the ground at other times. These results are due to some very gross errors made by the student during the golf swing itself.

The cognitive stage is also marked by performance that is highly variable. Although beginners may know that they are doing something wrong, they are generally not aware of exactly what should be done differently the next time to improve. As a result, they need specific information that will assist them in correcting what they have done wrong. The second stage of learning in the Fitts and Posner model is called the associative stage. The nature of the cognitive activity that characterized the cognitive stage changes during the associative stage. Many of the basic fundamentals or mechanics of the skill have to some extent been learned. The errors are fewer and less gross in nature. The learners are now concentrating on refining the skill. They have developed an ability to detect some of their own errors in performing the task. While this ability to locate their errors is not perfect, they are able to identify some of the errors. This provides the learners with some specific guidelines about how to continue practice. The golfer still slices the ball. He or she does not always get maximum distance or height out of the shot. However, the student can notice that he or she did not transfer weight properly, grip the club correctly, and so on. Such types of detections are rather gross in nature but represent a definite change in the course of the learning process. At this stage variability of performance from one attempt to another also begins to decrease.

After much practice and experience with the skill, the learner moves into the final stage of learning, the autonomous stage. Here the skill has become almost automatic or habitual. The individual does not have to attend to the entire production of the skill but has learned to perform most of the skill without thinking about it at all. Highly skilled golfers concentrate on the ball and some of the specific adjustments that they must make in their normal swing to produce a particular shot. Highly skilled dancers do not think about the individual steps of the routine, for they have become automatic. Instead, they have learned to concentrate on some of the more critical phases of the routine that are particularly difficult or that indicate that some major change in the routine is to begin. In this autonomous phase skilled performers are now able to not only detect their own errors but also make the proper adjustments to correct them. In this stage the variability of the day-to-day performance has become very small. The autonomous stage is the result of a tremendous amount of practice; it allows performers to produce a response without having to concentrate on the entire movement. Therefore, they are able to attend to other aspects that will permit optimal performance. Fitts and Posner state that "there is a good deal of similarity between highly practiced skills and reflexes." (p. 15). This does not mean that learning stops or that the individual ceases to make errors but rather that there ceases to be the need for conscious attention to the motor act itself. Thus, the highly skilled tennis player is able to serve without having to concentrate on the particular fundamentals of the serve, on how to hold the racket, toss the ball, and so on, but can concentrate on what is needed to produce a serve that will land in a particular part of the service court. It will help you to think of the three stages of the Fitts and Posner model as parts of a continuum of practice time, as depicted in Figure 2.2-1.

The cognitive stage represents the first portion of the continuum. This is followed by the associative stage and then the autonomous stage. It is important to realize that learners do not make abrupt moves from one stage to the next. There is a gradual changing of the learner's characteristics from stage to stage. It is often difficult to detect which stage best represents an individual at a particular moment, especially when that individual is in a transitional state, moving out of one stage and into the next. However, as we will discuss in more detail, the beginner and the skilled performer have distinct characteristics that need to be understood.