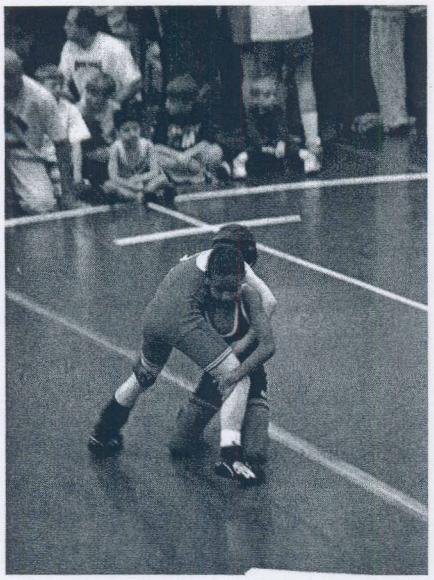

COVER Wrestling—well known to Americans from youth-league and interscholastic contests, as well as from physical education class—has many tactics in common with judo and other combative sports, which are gaining popularity in the competitive arena and in school curricula. As explained in "Teaching Combative Sports Through Tactics," starting on page 16, teachers can exploit this commonality by using the tactical games approach to facilitate the teaching of various combative sports.

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Using Multiple Intelligences to Teach Tennis

MELANIE MITCHELL MICHAEL KERNODLE

The theory of multiple intelligences has wide application, but few articles have discussed how to use it to improve the teaching of a specific unit in physical education.

Just as no two snowflakes are exactly alike, no two children are exactly alike. Physical education classes will have students with special needs, at different skill levels, from various cultures, and of different genders. In order to be an effective physical educator, the teacher needs to design and provide experiences that nurture the development of all children. Discovering the different abilities of the students and providing numerous, varied experiences are critical components in helping students to become physically educated individuals (National Association for Sport and Physical Education, 1992).

In 1983, Howard Gardner proposed in his theory of multiple intelligences (MI) that there were many ways to demonstrate intellectual ability. Gardner (1983, 1993) identified these ways of being smart as nine intelligences. According to Gardner (1993), intelligence is "the ability to solve problems or fashion products that are of consequence in a particular cultural setting or community" (p. 15). He suggested that individuals differ in their intellectual strengths and weaknesses, and a teacher or coach, in order to optimize the teaching/learning environment, must be able to identify and teach to these abilities by using a variety of highly correlated activities. In other words, the teacher or coach should teach with a range of instructional strategies that engage the different types of learners. In fact, unless teachers honor all intelligences, they cannot be true to the most important principle of education in a democracy: equal educational opportunity for all students (Kagan & Kagan, 1998).

The purposes of this article are to (1) provide an overview of eight of the nine identified multiple intelligences (the ninth is not relevant to movement skills) and (2) discuss how this knowledge (with specific examples) can be used to develop a more inclusive teaching environment by someone teaching or coaching tennis at the secondary level or in a college/university basic instruction program.

Student Profiles

Teachers and coaches first need to discover their students' unique patterns or profiles of intelligences. This will empower the teacher or coach to help the students translate a difficult learning situation into an opportunity to operate from intellectual strength.

Table 1. MI Assessment Scale Web Sites

- www.angelfire.com/oh/themidas
- www.ldpride.net/learningstyles.mi.htm
- pss.uvm.edu/pss162/learning_styles.html
- web.csuchico.edu/~ah24/intelligence.htm

The profiles provide a description of each student's intellectual strengths, weaknesses, and interests, and this information makes it possible for the teacher or coach to personalize instruction in order to improve motivation and learning and help develop the whole child (Kagan & Kagan, 1998). Many MI assessments have been developed to help educators create profiles for their students (e.g., the Multiple Intelligences Test and the Facet Tests, available in Kagan & Kagan). Several MI assessments are available online either as free downloads or purchasable items (table 1).

Once the profiles have been created, instructors can use the following activities to engage and foster specific intelligences. These activities are not meant to replace traditional teaching methods, but to enhance the learning process by broadening the physical education curriculum and stimulating the learning style most appropriate for each individual. The activities can be modified for use with individuals or groups.

Verbal/Linguistic Intelligence

Individuals who are strong in the verbal/linguistic intelligence are capable of using words effectively. They learn most effectively by reading, writing, listening to verbal presentations, and discussing the material to be learned. They often think in words rather than pictures. Traditional teaching and coaching techniques favor these types of learners because, in sports, the teacher or coach verbally tells the athlete how to perform the skill correctly and then provides feedback in the same manner. Even though students and athletes are conditioned to this traditional method of teaching, instructors can more fully develop learners' verbal/linguistic intelligence by offering a wider range of learning experiences during the teaching of new motor skills and tactical concepts. This will then allow for a more successful transfer from a practice environment to competition. Teaching strategies and activities that foster the verbal/linguistic intelligence incorporate languages, reading, writing, speaking, discussing, and listening. Instructors could incorporate the following activities into a tennis unit to help develop and enhance the verbal/linguistic intelligence.

Tennis Journal. Students write down descriptions of what they have learned with regard to strokes and strategies previously taught during the on-court experience (figure 1).

Crossword Puzzle. The instructor develops a crossword puzzle that includes descriptions of strokes and strategies learned during on-court lessons. The students could also develop their own crossword puzzles to share with others. There are several puzzle-maker web sites (table 2) that teachers and students can use to create many types of puzzles.

Figure 1. Tennis Journal

3/17/04: Today in tennis I learned how to perform the volley correctly. The volley is a shot that is hit before the ball bounces on my side of the court. The volley consists of a short backswing and follow-through, making sure the ball is contacted well in front of the body. Success is primarily based upon placement, which is a result of control of the racquet and ball. I feel that I have done fairly well in executing this shot. So far, this is one of my favorite shots.

Table 2. Puzzle-Maker Web Sites

- www.puzzlemaker.com/
- www.awesomeclipartforkids.com/worksheetsindex.cfm
- www.varietygames.com/cw/
- www.kidcrosswords.com/

Coach-Player Discussion. Students view a segment of a competitive match on videotape. They then describe the strategies and shots they would use based on the position of the players and the ball. Another way to incorporate this activity is to show a videotape of inappropriate strokes and have the students or players describe what was incorrect and what corrections they would make.

Visual/Spatial Intelligence

Individuals who are strong in the visual/spatial intelligence are able to perceive spatial relationships and tend to think in pictures or mental images. They learn most effectively through visual input, such as watching a model perform the skill or viewing diagrams of the tactical concept. Traditional coaching techniques generally use live models and/or videotape replay. The following examples suggest some nontraditional activities that enhance this intelligence:

Tennis Visual Aids. The teacher or coach places representations of player positions on a tennis court diagram and ask players to determine the next strategic move based on the player positions.

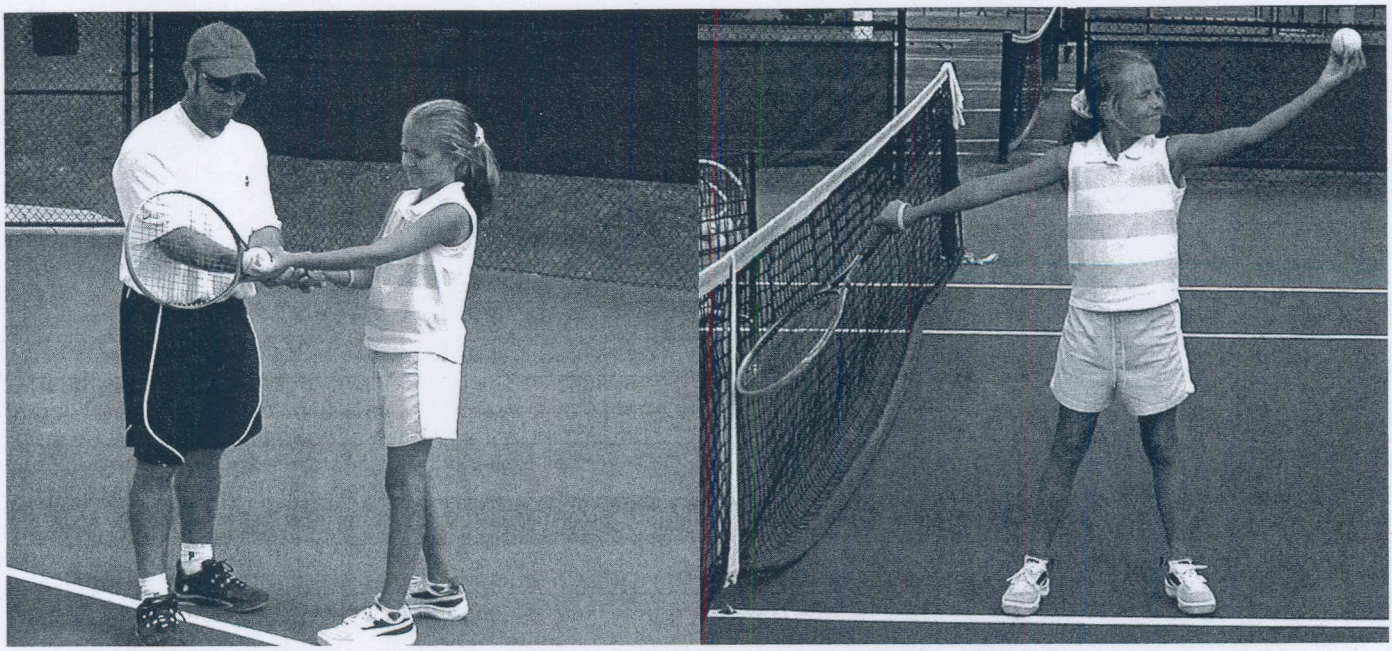
Tennis Mental Practice. The players create a mental image of either a specific stroke or a game-play experience.

Cue Recognition. Players write down, draw, or demonstrate relevant cues as exhibited by other players either in a live environment or on videotape.

Self-analysis. Players view themselves on videotape and write down or demonstrate the positive and negative aspects of their stroke production or decision making.

Bodily/Kinesthetic Intelligence

The bodily/kinesthetic intelligence relates to physical movement and knowledge of the body and how it functions. Individuals who are strong in this intelligence have the ability to manipulate objects and use a variety of physical skills, including both gross and fine motor skills, to express their emotions and ideas and to play games. These individu-



Photos courtesy of Michael Kernodle

Students who excel in bodily/kinesthetic intelligence can especially benefit from the use of guidance techniques. Using active guidance (left), a teacher physically directs a student's movement in the proper pattern. Passive guidance (right) makes use of a physical barrier—in this case the net—to restrict or channel the student's movement.

als can control their movements and handle objects skillfully. They learn most effectively through interacting with the space around them. Participating in athletics is obviously a large part of facilitating this intelligence. The following activities can improve bodily/kinesthetic intelligence:

Shadow Practicing. The students can shadow the teaching professional's movements as various strokes are demonstrated. For example, while the teacher demonstrates the components of the serve, the students practice the components without equipment.

Active and Passive Guidance. Guidance techniques (Kernodle & Turner, 1998) are used to restrict the learner to the appropriate movement pattern. They are frequently used in the early stages of learning or to change a preexisting, inappropriate movement. There are two types of guidance. Active guidance occurs when a teacher or coach actively (hands on) manipulates the learner through the desired movement. For instance, our bodily/kinesthetic player may be having trouble developing the timing needed to complete a successful serving motion (e.g., by separating the serving arm and tossing arm at inappropriate times). To help, the coach could grab the racquet hand and ball-tossing hand and actively guide them through the appropriate timing of hand separation. Passive guidance occurs when physical barriers restrict the learner to the appropriate movement pattern. The teaching professional can use passive guidance as a method to help the learner separate the tossing and serving hands at the appropriate time. This can be accomplished by positioning the server an arm and racquet's length from the net while facing the baseline. Starting from the normal ready position for the serve, the racquet should make contact with the net at approximately the same time as the ball leaves the tossing hand.

When using guidance techniques, the instructor should (1) gradually withdraw the use of the guidance so the learner will not become dependent, and (2) make sure the guidance does not interfere with the integrity of the movement.

In the Coach's Shoes. The player role-plays as the coach during this activity. He or she demonstrates a specific stroke to the teacher and/or others and describes the cues for that stroke.

Naturalist Intelligence

The naturalist intelligence is associated with the way in which individuals relate to their surroundings and the role those surroundings play in learning. Individuals who are strong in the naturalist intelligence are often very sensitive to changes in weather patterns and are adept at distinguishing among, classifying, and using features of the environment. The following examples show how to incorporate naturalistic activities when teaching or playing tennis:

Rate the Model. For example, using the service rating chart provided in figure 2, the learner would observe seven serves and rate the components of each serve on a scale from one (poor) to five (excellent).

Observe and Record Your Own Serve. After practice in observing and rating a model, the learner then rates his or her own performances using the rating chart (figure 2).

What's the Weather? Students practice during various environmental conditions (i.e., sunny or windy) and, using appropriate feedback methods, establish effective game-play strategies for each environmental circumstance.

Musical/Rhythmic Intelligence

The musical/rhythmic intelligence is used when individuals have the ability to communicate or gain meaning through music, by thinking in, with, and about music. Individuals

Figure 2. Service Rating Chart

	Initial Position	Routine	Knee Flexion	Toss Height	Back-scratch Position	Contact Position	Follow-through
1							
2							
3							
4							
5							
6							
7							

Table 3. The Illusive Point

Situation	Percentages								
Points	50.0	51.0	52.0	53.0	54.0	55.0	56.0	58.0	60.0
Game	50.0	52.5	55.0	57.5	59.9	62.3	64.7	69.3	73.6
Set	50.0	53.2	64.0	70.5	76.3	81.5	85.9	92.4	96.3
Tiebreak	50.0	57.1	56.3	59.4	62.4	65.4	68.3	73.8	78.7
Match (2-of-3 sets)	50.0	60.6	70.5	79.0	85.9	91.0	94.6	98.4	99.6
Match (3-of-5 sets)	50.0	63.2	74.9	84.3	91.0	95.3	97.8	99.6	99.9

who are strong in this intelligence enjoy listening to and creating music in many forms. They often think in rhythms, melodies, or lyrics and learn best through music or while music is played in the background. The following activities emphasize musical/rhythmical intelligence:

Let the Music Move You. A tennis match has a very rhythmical nature. As players practice the different skills, they should identify their own rhythms for each skill and create or locate a piece of music that emphasizes that rhythm. For example, the explosive movement of driving up and into the serve could be timed to match the sound of the canon in the *1812 Overture,* or the footwork needed for a volley drill could be matched with the chorus section of *Respect* by Aretha Franklin.

Music in the Background. During practice, play background music that emphasizes the mood and tone of each segment of the practice. For example, play soothing, relaxing music during the cool-down phase.

Mathematical/Logical Intelligence

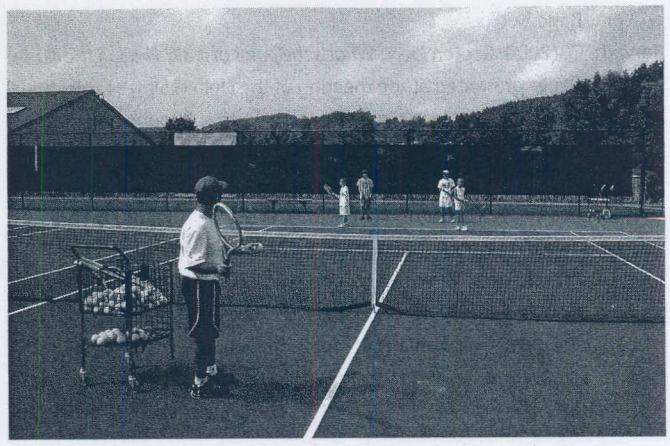
The mathematical/logical intelligence is associated with the ability to think in, with, and about numbers and relations. Those who are strong in the mathematical/logical intelligence enjoy solving problems, quantifying outcomes, and determining relations such as cause and effect. These individuals are good with quantifying, sequencing, analyzing, evaluating, synthesizing, and applying numbers and relations. They often learn best through activities that provoke logical thinking, or when numbers or math are involved. To enhance this intelligence, one can engage in activities that foster creating, thinking about, and solving problems; analyzing objects and situations for their components; using abstract symbols; and discovering and using algorithms and logical sequences. The following examples show how to incorporate mathematical/logical activities when teaching or playing tennis:

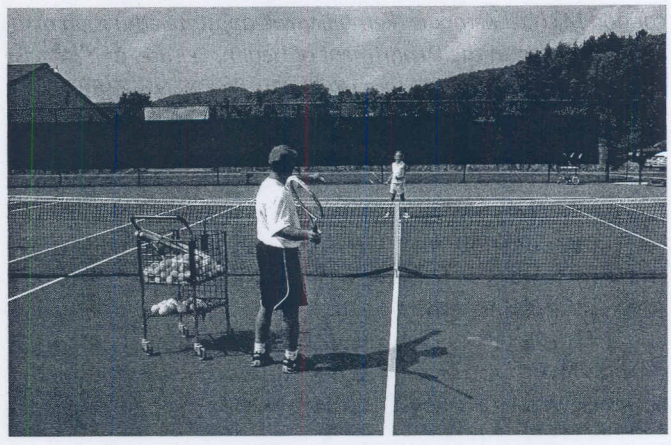
The Illusive Point. Table 3 summarizes the amplifying effect that results by winning an additional point (Horvath, 2000). It illustrates how point, game, set, tiebreak, and match probabilities differ. For example, if a player wins 50 percent of the points, he or she wins 50 percent of two-of-three set matches and three-of-five set matches. However, if the player wins 2 percent more points (52%), he or she wins 70.5 percent of two-of-three set matches and 74.9 percent of three-of-five set matches.

Court Logic. Place the players in various locations on the court and ask them to describe where their next shot should be hit to and to what part of the court they should recover.

Interpersonal Intelligence

The interpersonal intelligence is used when individuals interact successfully with others. Individuals who are strong in this intelligence enjoy caring for others and learning in cooperation with others. These individuals are characterized by leadership skills, friendship skills, and the ability to understand points of view different from their own. These players will probably enjoy clinics more than private lessons and doubles more than singles. They will thrive as a member of a United States Tennis Association, high school, or college team. Instructors can develop the interpersonal intelligence by using student debates, cooperative learning, and interviews of peers and experts. The following are





Photos courtesy of Michael Kernodle

Emphasizing the team experience (above) and teaching a group lesson (right, above) will have the greatest value for students with strong interpersonal intelligence. By contrast, students oriented toward intrapersonal intelligence may prefer a private lesson (right, below).

examples of interpersonal activities:

Being a Team. Students write what they think it means to be part of a team, identifying specific characteristics of a team. Then the students share their descriptions with one another, identifying what is similar and/or different in everyone's description.

Team Interview. Each participant has the opportunity to be an interviewee and an interviewer. One participant is asked questions about tennis. For example, "What is your favorite stroke?" Then the results of the interview are summarized and shared with other members of the class.

Pro Interview. Each participant interviews a tennis pro or an "established" tennis player, asking them questions about the game of tennis. For example, "How do you prepare before a match?" or "What is your favorite shot and why?" The results of the interview are summarized and shared with the class.

Intrapersonal Intelligence

Individuals whose learning style is oriented towards the intrapersonal can focus on and understand internal stimuli and use this intelligence to be introspective. They are aware of their own feelings, strengths, ideas, values, and beliefs, and they enjoy setting and meeting goals and using private time to think and reflect. Those who are strong in the intrapersonal intelligence often learn more effectively when they are given time to process information, formulate their ideas, and reflect on their learning. Intrapersonal tennis players will probably prefer private lessons to clinics, singles more than doubles, and participation in tournaments as a separate entity. They also may enjoy the solitude of working out against a ball machine or backboard. The following are examples of how to incorporate intrapersonal activities when teaching or playing tennis:

My Resume. The learners create a resume of their strengths when playing tennis. This should resemble a portfolio to provide to tennis scouts, describing how long the players have played, their tennis goals, tennis honors received, and other interests.

Like or Unlike Me. After playing a match, players will complete a description of their performance by using animals to describe their strengths and weaknesses. For example, "When executing my forehands, I was like a cat pouncing and striking sharply."

Summary

In this article, eight of the nine intelligences described by Gardner (1983, 1993) were profiled and then illustrated with specific tennis examples. By integrating into their daily lessons a wide range of teaching strategies and activities, such as those described in this article, teachers and coaches will foster student growth in all of the intelligences. When teachers and coaches use instructional strategies that match the intellectual strengths of individual students, they are providing greater access to the curriculum for those students, helping them to excel in their learning. Offering a variety of activities that enhance different intelligences also helps students who are weak in certain intelligences by giving them the opportunity to improve themselves in those areas. Throughout a teaching unit, the teacher should encourage many different ways of learning so that all students are practicing the material with success in a structured learning environment.

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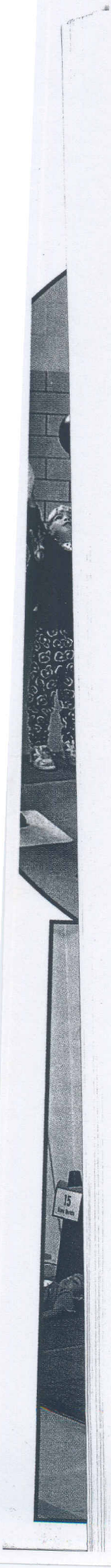

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physical education may serve as a bridge that helps move students toward becoming more self-directed in their pursuit of lifelong health.

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