



Research Report of the Month
MAY 2005

Harrison, J.M., Blakemore, C.L., Richards, R.P., Oliver, J., Wilkinson, C., & Fellingham, G. (2004).

The effects of two instructional models – Tactical and Skill Teaching – on skill development and game play, knowledge, self-efficacy, and student perceptions in volleyball.

The Physical Educator, 61, 186-199.

This study is cast in a very old-fashioned format, “method A versus method B,” a head-to-head comparison of two methods of game instruction in physical education. Paradoxically, however, in several ways it turns out to be singularly modern in both form and function. First, antique format or not, this study has more thoughtfully considered and creatively designed bells and whistles than you will find in a whole hatful of pedagogical studies. And second, at the bottom line, when the implications of the findings are contemplated by a physical educator, they may be judged far more profound in their implications than any of those large-scale, federally funded investigations that meet all of the new government standards for randomized field trials. Listen to the story told in this report and see what you think.

BACKGROUND

By long tradition, physical education lessons involving the teaching of a game begin with a brief explanation and demonstration of a motor skill to be used during play, followed by drills designed to provide practice of that skill and, after a number of skills have been so introduced, by play of the full game. For reasons that are both widely recognized and thoroughly documented by research, that model of instruction fails to reliably produce significant gains in learning for many students. Notably, both low-skilled and poorly motivated students fail to acquire enough skill or tactical sense to engage in playing the game.

The **Tactical Teaching** model for instruction used in this study (known otherwise and as the “Tactical Game Approach” or “Games for Understanding”) turns the traditional model upside down. Each lesson begins with identification of a problem encountered in game play, and then, using student-based problem solving, moves to practice of a skill that constitutes a strategically appropriate response to the problem. The cycle is repeated as the students’ “game sense” builds, and their repertoire of tactically related motor skills gradually widens.

In contrast, the **Skill Teaching** model for instruction used here begins with stress on acquisition of motor skills but, unlike the traditional approach, is structured to produce a large number of ball contact trials for all students (with special attention to students with a lower level of entry skills). Instruction then moves progressively to game-like drills that emphasize the conditions required to produce successful trials. Strategic concerns are introduced at a later point through participation in modified games.

Previous efforts to compare the two methods for such outcomes as skill development, game performance, knowledge, and affective responses have produced mixed and inconclusive results. The authors attribute some of this ambiguity to the use of skill teaching methods that too often

have been no more than relatively weak forms of traditional instruction, a problem addressed, they assert, by the more robust design of the Skill Teaching model used here. The authors do not directly say so, but there also has been some skepticism among physical educators about the claim that tactical approaches to instruction can develop required motor skills to a level sufficient for game participation.

PURPOSE

The investigators sought to determine the development of volleyball skills (set-up, passing, serving, and spike), game play performance (indicated by number of successful, legal, and appropriate hits during full-scale games), sense of self-efficacy, knowledge, and attitudes in high- and low-ability students when taught volleyball by either the Skill Teaching or Tactical Teaching method.

SETTING AND PARTICIPANTS

In six beginning volleyball classes (intact and coeducational) meeting twice weekly for 16 weeks, 169 university students were classified on the basis of performance on pretest measures of volleyball skill into higher-skilled (34 females and 77 males) and lower-skilled (51 females and 7 males) sub-groups.

RESEARCH DESIGN

The study used a quasi-experimental pretest/posttest design without a control group. Two treatments were applied, and multiple dependent variables were measured.

INTERVENTION

Three veteran instructors each taught one randomly assigned class using the Skill Teaching method and one using the Tactical Teaching method. The instructors were trained in both methods, used standard lesson plans, met weekly with an investigator to resolve problems and address questions, and were monitored in each class meeting to insure fidelity of treatment method.

DATA COLLECTION

Skill, Pretest, midterm test, and posttest employed standardized AAHPERD volleyball skill tests.

Game Play, Full 6-on-6 games were played and videotaped on days 4, 14, and 21-26 (a tournament). Then, the tapes were randomly assigned to trained coders who rated every hit as *successful* (legal and tactically appropriate), *legal* (but not tactically appropriate), or *incorrect* (none of the above). Intrarater agreement after a one month interval was above 90% for both coders, and interrater agreement was established at 87%. Percentages for both successful and legal trials were calculated for each student in each game. Total successful contacts per serve were determined by adding the sets, passes, and spikes attempted per game and dividing by the number of legal serves.

Knowledge, An objective written test of rules, strategies, and techniques was administered on the 1st and 20th days.

Self-Efficacy, Skill-related self-efficacy scales (rating how confident students were that they could perform each skill task) were administered during each of the three rounds of skill testing. Test-retest reliability after a one week interval was .92 for all of the subscales.

Attitude, An instrument designed to assess students' attitudinal dispositions toward volleyball, class instruction, and their personal improvement was administered as a posttest.

DATA ANALYSIS

Descriptive statistics were calculated for each measure. A random coefficients growth curve model was used to assess learning over time for higher- and lower-skilled students under each treatment condition. A group by gender MANOVA was used to analyze data from attitude tests.

FINDINGS

Both treatment groups produced statistically significant improvements on all outcome measures. In virtually every case, those gains had practical consequences in the students' growing ability to play the game. Better skills were the precursors of higher percentages of successful and legal hits. Those, in turn, produced more contacts per serve and longer, more exciting rallies.

With minor exceptions there were no significant differences between the two treatment groups on any of the outcome measures. For all practical purposes the Tactical Teaching and Skill Teaching models of instruction produced the same results for skill learning, game play, sense of self-efficacy and attitude.

The analysis of learning curves for the two skill level groups, however, showed some sharp differences. For a number of measures, the upward growth curves for the lower-skilled group were much steeper, thus bringing the plotted curves for the two ability groups closer together at the end of the unit. A traditional interpretation of this finding would be that the lower-skill group had more room in which to make rapid improvements, while students in the higher-skill group might have been closer to the ceiling or limit of their capacity for performance.

The convergence of learning curves over time did not remove initial differences in basic motor ability, and higher-skilled students continued to contribute significantly more successful and legal hits per serve than did the lower-skill students. An interesting exception to the overall pattern of results was revealed in the finding that higher-skilled students had the steeper upward learning slopes for the spike, a fact that obtained for both successful spikes (legal and tactically appropriate) and those that were rated as simply legal.

Student responses on the posttest attitude scale indicated a high (5.7 on a 7-point scale) level of enjoyment for the game of volleyball. That outcome was obtained even though the participants in the study rated their playing ability as no more than modest (4.0 on the same scale). Not surprisingly, however, gender analysis revealed that males had a significantly higher estimate of their capacity to play well. Nearly all of the 169 students answered "yes" when asked if they were better at playing the game at the end of the unit, and, tellingly, 96% indicated that they liked physical education classes in which instructors tried to teach them something.

CONCLUSIONS

The authors cautiously focus their discussion of conclusions on the most obvious finding. The two methods of instruction produced equivalent levels of improvement on skill tests, sense of self-efficacy, knowledge and game play. Their most adventuresome observation is that the findings in this study are consistent with the recent assertions of Michael Metzler in his text *Instructional Models for Physical Education* (2000, Boston: Allyn & Bacon) that "...there can be no one best way to teach physical education" (p. 14). That allowed them to take a gentle poke at adherents of alternative models who insist that theirs' is the best way to achieve game play proficiency.

The researchers do remind the reader that the game performance measures used in this study did not assess the adequacy of play away from the ball. As that factor is a particularly important outcome for Tactical Teaching, the absence of attention to that more subtle skill must be counted as a potentially significant limitation. To that caveat I wish to add a reminder that methods of practice that appear to be equivalent at the introductory level of play may not prove to be equal when students move to more advanced skills and more challenging game contexts.

To close, I think it is important for me to point to one of the findings reported here that has far greater implications for physical education than any conclusion the investigators thought it prudent to name. If you read the study closely, including the table that displays daily instructional activities for the two models, you will notice that Skill Teaching and Tactical teaching have similar foundations.

The six instructors were subject matter specialists, thoroughly trained in the two forms of pedagogy, using carefully planned lessons and receiving both regular supervision and significant forms of support. Their efforts were directed at creating a positive learning environment in which all students (notably the lower-skilled) received a large number of practice trials in situations that helped them be successful in game play. They had classes of appropriate size with meetings of sufficient length over an adequate span of time. And, finally, given the pervasive 16 week focus on testing and tracking development of individual playing skill, it is patently obvious that students in both kinds of classes regarded themselves as accountable for learning how to play volleyball (a point roundly confirmed by student responses on the attitude scales).

Think about that common foundation for a moment. Once those conditions were in place, do you think that either set of assumptions about the respective place of skill and tactics would yield comprehensive superiority or, for that matter, would any other carefully modeled set of assumptions that was sufficient to guide the detailed sequence of instruction? What Professor Harrison and her colleagues have displayed in this report is precisely the definition of what is required for sound physical education – anywhere, anytime, for any learners, at any school level, with any activity, and for any model of instruction you can devise.

Surely we should continue to develop and test alternative models for instruction. Just as surely, however, none of those models can make the kind of difference for learners that can be provided by the set of foundational conditions laid out above. They constitute the always necessary and generally sufficient context for doing our work. This study may not have been designed to reveal that particular result, but it is what I found in the report. It also is likely to be the conclusion I shall always remember.

Your comments on this annotation will be welcome at lflocke@hotmail.com.

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