DOCUMENT RESUME

ED 319 713 SP 032 330

AUTHOR Fox, Connie
TITLE Strengthening Teacher Preparation for Motor Performance Skill Development--Motor Processes Approach.
PUB DATE 30 Mar 90
NOTE 20p.; Paper presented at the Annual Meeting of the American Alliance for Health, Physical Education, Recreation and Dance (New Orleans, LA, March 28-31, 1990).
PUB TYPE Speeches/Conference Papers (150) -- Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Elementary Education; Higher Education; Learning Processes; *Movement Education; Preservice Teacher Education; *Psychomotor Skills; *Skill Development; *Teacher Effectiveness; *Teaching Methods; Volleyball

ABSTRACT

In a study of beginning collegiate volleyball players, two classes were assigned to a traditional approach, and two to a Motor Processes Approach. Following 8 weeks of instruction, the Motor Processes classes were significantly better on the set, serve, and pass, and were more knowledgeable. Students indicated that they believed they learned equal amounts in each class, but there was a significant difference in their perceptions of the instructor's knowledge. Perhaps because the Motor Process instructor used individual learning tasks and asked more questions, the students believed that the instructor was not knowledgeable about volleyball. In a separate study of first and second graders learning to jump rope, to use an overhand throw, and to strike with a paddle, similar results were found. Students with Motor Process instruction acquired skills to a greater extent than did students with traditional instruction. The Motor Process group spent significantly more time on task and had a higher rate of repetition of skills. (JD)

Strengthening Teacher Preparation for Motor Performance Skill Development- Motor Processes Approach

Dr. Connie Fox
Assistant Professor
Northern Illinois University

Paper originally presented at
American Alliance for Health, Physical Education,
Recreation and Dance
annual Convention
New Orleans, LA
March 30, 1990

At this convention and at others you might attend, you might be struck by the number of "new" games and activities available - pickleball, hocker, ultimate frisbee and more. These activities are welcomed in a field who primarily relies on a Disciplinary Mastery value orientation.

However, as the amount of information increases and more games and sports are available to learn, students and teachers are overwhelmed by the volume of material to be learned. The difficulty of identifying the knowledge of most worth and the possibility of learning it all has led to a shift in value positions.

The learning process value position contends that how information is learned is as important as what is learned (Jewett and Bain, 1984). The focus is on teaching children how they acquire skills while using skills to demonstrate acquisition. This is the approach currently in vogue, in elementary education, where "whole language" is the terminology. In physical education, the Motor Process Approach is a model suitable for teaching children how they acquire motor skills.

The Motor Processes were developed by Jewett and associates (Jewett and Mullen, 1977), but until recently, have had little application in public school education. In higher education, the theory is introduced to physical education majors, but application is typically not available.

The Motor Processes Approach is a curricular model which assumes that motor skills are acquired through a hierarchial ordering of activity. To learn a skill, it must be perceived (cognitively understood in terms of its movement sequences, forces and its use in the activity) (Figure 1), then patterned (a motoric response in an attempt to execute the movement) (Figure 2). After a rudimentary pattern is developed, the skill must be accommodated (used in specific settings or under specific conditions prescribed by the teacher) (Figure 3), then refined (eliminate movement errors and habituate the skill) (Figure 4). Many traditional physical education programs include these four levels. However, most programs ask students to refine before they are ready, causing emphasis to be placed on outcome of the skill (i.e. how many baskets can be made how far can a ball be thrown, how fast can a distance be run) rather than the process of acquiring the skill and need for biomechanically correct execution. The Motor Processes emphasize form of movement rather than outcome, and they emphasize development of the process. Once a student has refined a skill, he is ready to use the skill more creatively. The skill must now be varied (using the skill in a novel way following a conscious decision, by the mover, concerning how to use the skill) (Figure 5), then improvised (making changes in the skill without precognition) (Figure 6). Finally, the student is ready to compose (put together a combination of skills unique to the student) (Figure 7). Traditional programs put students in game situations well before they can play effectively. A game is composed of novel situations and requires ready varying and improvising of skills. If students are still learning how to do a skill, they can't change to meet game situations. If they have learned how to learn and have accommodated in a variety of ways and have refined those accommodations, they can improvise when learned skills are inadequate and they can compose their own plays and strategies. Much emphasis is placed on the ability of the students to determine what they need to know and how they can know it.

This approach has tremendous implication for physical education. Physical education programs offer many more courses or activities than a student will be able to take. Thus, the student is benefitted if he can apply concepts from one course to another. Once a student is able to identify the process by which motor skills are learned, he can virtually teach himself any skill. In baseball, the student develops the ability to strike a moving object, and learns the process of how striking is learned. Then the student may pick up a golf club, watch golfers in order to perceive the pattern and apply striking concepts with modification for use in golf. The student knows to develop a pattern, then accommodate for different clubs, refine and so forth. The student has learned how to teach himself.

In a recent study of beginning volleyball players, comparisons between traditional physical education/recreation and Motor Process Approach was made. Four classes of students were randomly assigned two to each teaching method. All were pre-tested on basic volleyball skills and an ANOVA revealed no differences between the classes. Each 8 week class was taught by the same instructor and each class was approximately the same size and same distribution of males and females. At the conclusion of the course, students were given the skills test again, were given a paper and pencil test of techniques and rules and were given a teacher evaluation. Data were analyzed for each test by way of an ANOVA using an alpha level of .05 for rejection.

Results are evidence that classes taught in a Motor Processes Approach are significantly better on all three skills tests. They have significantly more knowledge about the game and techniques of skills and they differ in their perception of teaching effectiveness (see Table 1).

It is obvious that the Motor Processes will allow students to refine motor skills at a greater proficiency than traditional classes perform. For all three skills tests, the traditional classes were performing at or below the national 50th percentile, and Motor Processes classes were between the 60th and 70th percentile. In addition, 20 students from each method were randomly selected to return 3 months after the course to repeat the setting test (see Table 1 - follow-up setting). Again, an ANOVA revealed significant difference between the two methods. The Motor Processes group was more skilled on the follow-up than the traditional group. Both groups were less skilled on follow-up than on their original, but not significantly so. In addition, the Motor Process group declined less on follow-up than did the traditional group.

The difference in perception of teacher effectiveness is very interesting. The Motor Processes classes indicated that their teacher knew significantly less about the sport than did the group with traditional instruction. Both methods were taught by the same teacher. Perhaps the explanation lies in the student expectations. Traditionally, students expect teachers to demonstrate and design drills for each skill. The teacher tells the student how to do it, then puts them into a game situation. The Motor Process teacher relies heavily on questioning students and getting students to identify how movement feels, how they might correct errors and how they might modify movement. Students are rarely told how to perform but are asked to discover how they performed. This puts the responsibility for learning on the student. This is so different from what usually happens that they perceive the teacher as unable to answer their questions. However when asked how much they thought they had learned, then was no difference in responses from the two group.

Because the previously mentioned research used college students, the investigator wondered what differences in learning would be found in elementary students between the traditional and the Motor Processes Approach. Because those students don't typically take "skills tests", written tests or teacher evaluations, other signs of differences were developed.

The investigator and the elementary specialist jointly identified three skills regularly taught to first and second graders (overhand throw, striking and jumping). Each skill was broken into focal points which emphasized correct biomechanical form of the skill, using Wessel and Kelly's I CAN. The specialist enrolled for a workshop taught by the investigator which taught how to use the Motor Processes. Following the workshop, lesson plans were developed which were consistent with the approach. Video tapes of all lessons were made and analyzed using Harrington's Feedback Diversification Classification System to insure fidelity to the method.

Students were pretested on all skills, then taught. A post test was given following instruction in each unit. No difference was found on any pretest between traditional (control) or Motor Processes (experimental) classes (See Table 2 for jumping example). Interesting enough, no difference was found between 1st and 2nd graders or between girls and boys. Post tests were analyzed using a chi-square to determine differences between skilled and unskilled performance between the 2 methods. Skills used were jumping long ropes, overhand throw and sidearm striking (See Tables 3, 4, and 5). All differences were tested at alpha = .05. The Motor Processes approach for all three skills elicited better form in performance than did traditional method.

Additional analysis of the classes showed a greater amount of time spent in motor appropriate activities in the Motor Process groups than in traditional instruction. Traditional instruction left the very poorly skilled behind and bored the few highly skilled. The Motor Process Approach more thoroughly offers activities to challenge each skill level. Although these differences were significant, this analysis was only coded for 1 day during each unit, so the relevance may be questionable. It may also be noted that examination of rate of response is higher in Motor Process classes. Students attempt the skill more often. Again, this analysis is incompleted due to the limitation of days the investigator could code. Further analysis of films is the next step to see if these findings hold for days the investigator was absent.

Further study will also include use of the Motor Processes in middle school and high school settings.

TABLE 1
MEANS OF SKILL TESTS, PAPER AND PENCIL TEST AND TEACHER EVALUATION

	Serving	Setting	Forearm Pass	Follow-up Pass
Traditional Volleyball	24.3	37.4	30.4	32.1
Motor Process Volleyball	27.7*	43.6*	37.1*	34.9*

	Knowledge	Teacher Knowledge	Students Learning
Traditional Volleyball	18.1	4.1	4.3
Motor Process Volleyball	22.5*	2.7**	4.4

*Significantly greater at alpha = .05
**Significantly less than at alpha = .05

TABLE 2

PRE-TEST JUMPING

	CONTROL	EXP
SKILLED	1	5
NOT SKILLED	52	69

χ^2 = .7[illegible]5

Not significantly different

TABLE 3

POST-TEST JUMPING

	CONTROL	EXP
SKILLED	14	34
NOT SKILLED	39	40

$\chi^2 = 5.011$

Significant at $\alpha = .05$

TABLE 4

POST-THROWING TEST

	CONTROL	EXP
SKILLED	26	51
NOT SKILLED	27	23

$\chi^2 = 8.663$ Significant at $\alpha = .05$

Prethrowing was not significant. 6/53 control were skilled. 8/74 exp were.

TABLE 5

POST-STRIKING TEST

	CONTROL	EXP
SKILLED	9	31
NOT SKILLED	44	43

$\chi^2 = 8.882$ Significant at $\alpha = .05$

Pre-striking was not significant. 1/53 control could do it. 0/74 experimental could.

FIGURE 1

PERCEIVING

GETTING THE IDEA OF THE MOVEMENT

PURPOSE OF THE MOVEMENT

AWARENESS OF BODY RELATIONSHIPS AND SELF IN MOTION

KINESTHETIC FEEL OF MOVEMENT

RECOGNITION OF THE MOVEMENT

DISTINGUISHING FEATURES OF THE MOVEMENT

FIGURE 2

PATTERNING

DEVELOPING RUDIMENTARY SKILL EXECUTION

ARRANGING BODY PARTS IN SUCCESSION IN ORDER TO ACHIEVE SKILL

HIGHLY DEPENDANT ON FORM OF MOVEMENT

NOT CONCERNED WITH OUTCOME OF MOVEMENT

FIGURE 3

ACCOMMODATING

MODIFYING PATTERN TO ACHIEVE EXTERNAL TASK DEMANDS

PERFORMING UNDER DIFFERENT CONDITIONS

CHANGING ENVIRONMENT, SIZE AND SHAPE OF OBJECT, CHANGING SPEED AND DIRECTION OF FORCE, CHANGING STARTING POSITION

FIGURE 4

REFINING

ACQUIRING SMOOTH AND EFFICIENT CONTROL OF MOVEMENT

HABITUATING PERFORMANCE

ACHIEVING PRECISE PERFORMANCE

OUTCOME OF MOVEMENT IS CRITICAL

FIGURE 5

VARYING

PLANNING WHICH WILL CHANGE THE MOVEMENT

INVENTION OF PERSONALLY NOVEL MOVEMENT OF A SKILL

REQUIRES INSIGHT AND COGNITION TO CREATE OR MODIFY THE MOVEMENT

FIGURE 6

IMPROVISING

EXTEMPORANEOUS INVENTING OF NOVEL MOVEMENTS OR COMBINATIONS OF MOVEMENTS

RESPONDING TO CONDITIONS OR REQUIREMENTS OF MOVEMENT WHILE MOVING

NO CONSCIOUS PLANNING OF THE MODIFICATIONS OF THE MOVEMENT

FIGURE 7

COMPOSING

COMBINING LEARNED MOVEMENTS INTO PERSONALLY UNIQUE PLANS

INVENTING MOVEMENT SEQUENCES FROM LEARNED DISCRETE MOVEMENTS

REQUIRES INSIGHT INTO PURPOSE OF MOVEMENT

REQUIRES ABILITY TO ANTICIPATE MOVEMENT SEQUENCE TRANSITION