

Influence of a Physical Education Methods Course on Elementary Education Majors' Knowledge of Fundamental Movement Skills

Melanie A. Hart

Abstract

With an increase concern for childhood obesity, many individuals and organizations are emphasizing the importance of quality physical education. The need for quality physical education at the elementary level is extremely important as research has shown a relationship between the performance of fundamental movement skills and children's body weight. However, quality teaching requires a knowledge base of the subject matter. At the elementary level, some states allow the classroom teachers to provide physical education instruction to their students, and many of these teachers lack a physical education knowledge base. The purpose of this study was to assess the influence of physical education methods courses on the knowledge of elementary education majors in the area of fundamental movement skills. The data were obtained by using a questionnaire to assess students' knowledge by having them list fundamental movement skills before and after completing an elementary physical education methods course. The results suggest completion of a physical education methods course positively influences elementary education majors' knowledge of fundamental movement skills.

The percentage of obese children in the United States is at an all time high, and the percentage seems to be on a steady increase (CDC, 2004). With an increased concern for childhood obesity, many individuals and organizations are emphasizing

the importance of quality physical education (AAHPERD, 2004). The need for quality physical education at the elementary level is extremely important as research has shown a relationship between the performance of fundamental movement skills and youth's body weight (Booth, Chey & Southall, 2002), physical activity (Okely, Booth & Patterson, 2001a) and cardiorespiratory endurance (Okely, Booth, & Patterson, 2001b). In a study conducted by Wall and colleagues (Wall, Rudisill, Goodway & Parish, 2004), it was concluded that children require quality instruction, not just exposure to equipment and practice opportunities to develop appropriate fundamental movement skills.

The teaching and assessment of fundamental movement skills are very important for the children's motor development and continued participation in physical activity (Okely et al., 2001a; Wall et al., 2004). Payne and Isaacs (2002) have suggested that fundamental movement skills are the "building blocks" of more specific sports-related skills. The development and mastery of fundamental movement skills should occur during the preschool and elementary years (Gabbard, 2000). Without mastery of fundamental movement skills, children will lose interest and eventually drop out of most if not all physical activities (Eckert, 1987). Clark and Metcalfe (2002) summarize the importance of fundamental movement skills in the following statement:

Indeed, these fundamental motor patterns form a base camp to which the individual

may always return as he attempts to climb the various peaks (skills) on the mountain of motor development. (p. 178)

If children have a strong foundation in the fundamental movement skills, they are more likely to enjoy participation in physical activities, and are more willing to attempt new skills and activities (Okley et al., 2001a). These attributes are required for a lifetime of physical activity.

“The National Association for Sport and Physical Education (NASPE) recommends that federal and state education entities greatly increase their efforts to improve the availability and quality of physical education throughout the nation.” (NASPE, 1998, p. 3) One way to ensure “quality physical education” is to require skilled, competent instructors in physical education. However, at the elementary level, only four states require physical education instruction by certified physical educators (NASPE, 2002). In the remaining states, many elementary classroom teachers are expected to provide the physical education instruction for their students. However, all elementary education majors are not required to complete a methods course in physical education (Humphries & Ashy, 2002). Of the 134 respondents in the Humphries and Ashy study, 92 reported requiring a physical education methods course for elementary education majors. Additionally, another 16 reported offering a physical education methods course for elementary education majors as an elective. These results suggest that approximately 30% of the respondents do not require the class and almost 20% do not even offer such a course for elementary education majors. Many of the institutions offering such a course required field experiences. However, before an individual can successfully participate in a quality field experience he or she must possess content knowledge that is the basis of the field (Faucette & Patterson, 1990).

Research has shown effective teachers must possess a strong knowledge base in the subject matter which they teach (see Allen, 2003; Darling-Hammond & Youngs, 2002 for reviews).

Therefore, it is crucial that individuals (physical education specialists or nonspecialists) who teach physical education to children possess extensive knowledge of physical education, especially fundamental movement skills. Possessing knowledge pertinent to the psychomotor and health-related fitness domains (Lacy & Douglas, 2003) allows the teacher to select activities and instructional strategies that will allow children to master the fundamental movement skills (Faucette, McKenzie & Patterson, 1990), as well as other aspects of physical education. However, not much is known about the influence of physical education methods courses on elementary education majors’ knowledge of physical education subject matter. Thus the purpose of this study was to assess the knowledge of fundamental movement skills in elementary education majors, and to assess the influence of a physical education methods course on the knowledge of elementary education majors in the area of fundamental movement skills.

Methodology

Participants

Participants in two physical education methods courses, a full-semester course ($N=20$) and a half-semester course ($N=45$) served as the treatment groups. Participants in a half-semester health methods course ($N=33$) served as the control group. All participants signed an informed consent and were naïve to the purpose of the study.

Procedures

On the first day of class the students in each course were asked to complete an open-ended questionnaire. The questionnaire instructed students to list as many fundamental movement skills as possible, and to describe why fundamental movement skills were important. The first step in adding knowledge is to be able to identify the concepts and then understand the importance of these concepts. Additionally, information with regards to the level of progress towards the

completion of the student's program of study was obtained. The questionnaire was validated using face validity by a panel of experts. Reliability was determined by the test-retest method. The resulting reliability coefficient was 0.79. Following the completion of the questionnaire, the participants completed the requirements for each class. The knowledge component for the physical education methods courses (half- and full-semester) was identical. The students in the full-semester course had more field experiences than the students in the half-semester course. The students in the health education course did not receive any instruction with regards to physical education. On the last day of class, the students in each course were asked to complete the questionnaire (same as pre-instruction questionnaire). The pre- and post-instruction questionnaires were paired according to the students' identification numbers.

Analysis

To analyze the lists of fundamental movement skills, pre-instruction responses were tabulated. The total number of responses for the listing of fundamental movement skills and the number of correctly identified fundamental movement skills (according to Payne & Isaacs, 2002) were recorded. From these two values a ratio of correctly identified fundamental movement skills to the total responses was calculated for each individual. The procedure was then repeated for the post-instruction responses.

Results

Fundamental Movement Skill Listing

The pre-instruction ratios were analyzed using a 3 x 2 (Group X Test) analysis of variance with repeated measures on the last factor. The results of the ANOVA indicated a significant main effects for Groups, $F(2, 95) = 11.617, p < .05$, and Test, $F(1, 95) = 92.551, p < .05$. Additionally, the Group X Test interaction was significant, $F(2, 95) = 8.107, p < .05$ (see Table 1), The increase ratios (i.e., more fundamental movement skills were

correctly identified) were greater for both of the experimental groups compared to the control group.

Many of the responses to the question requiring a listing of fundamental movement skills were skills such as, combing hair, brushing teeth, talking, sports, eating, moving eyes, blinking, clapping etc. The data were analyzed using a 3 x 2 (Group X Test) ANOVA with repeated measures on the last factor (See Table 2 for the means and standard deviations). The main effects for group and test were significant, $F(2, 95) = 7.86, p < .05$ and $F(1, 95) = 26.20, p < .05$, respectively. The interaction was also found to be significant, $F(2, 95) = 10.10, p < .05$. The ratio of these responses decreased for the two experimental groups from pre-instruction to post-instruction, but the ratio did not statistically change for the control group (see Table 2).

Importance of Fundamental Movement Skills Responses

The responses on the pre-instruction questionnaire for why fundamental movement skills are important were very similar for all of the groups (see Table 3). The responses on the post-instruction questionnaire were very similar to the pre-instruction questionnaire for the control group. However, the majority of the responses on the post-instruction questionnaire for the two experimental groups stated fundamental movement skills are important for building the basics of movement (e.g., basics of other skills, building blocks, etc.).

Discussion

The purpose of this study was to assess the knowledge of fundamental movement skills in elementary education majors, and to assess the influence of a physical education methods course on the knowledge of elementary education majors in the area of fundamental movement skills. The results of this study suggest completion of a physical education methods course increases elementary education majors' knowledge of fun-

damental movement skills. Both of the experimental groups exhibited an increase in the ratios of correctly identified fundamental movement skills. Additionally, on the pre-instruction questionnaire for all groups and the post-instruction questionnaire for the control group, many various movements were listed (e.g., combing hair, brushing teeth, talking, sports, eating, moving eyes, blinking, clapping, etc.). These skills were not listed as frequently on the post-instruction responses for the treatment groups. These results suggest the knowledge of the students in the area of fundamental movement skills changed as a result of the physical education methods courses.

An interesting result was that most (80%) of the accurately identified fundamental movement skills were locomotor skills followed by manipulative skills, even for the post-instruction questionnaire. This is interesting because all fundamental movement skills were equally stressed during the instructional period in the experimental groups. However, the locomotor skills were taught first which may have allowed more time for the processing of those skills than the manipulative skills (i.e., primacy effect).

NASPE and others have the goal of quality physical education for all children (NASPE, 1998; 2002). This goal is in large part due to the concern for the rising rates of obesity among school-age children (AAHPERD, 2004; CDC, 2004). Quality education (Allen, 2003; Darling-Hammond & Youngs, 2002), and most especially physical education requires that the instructor possess a knowledge base in the discipline (Faucette & Patterson, 1990; NASPE, 1998; 2002; Wall et al., 2004). The results of this study indicate that elementary education majors' knowledge (i.e., recall) of fundamental movement skills is increased by the completion of a physical education methods course. Therefore, the requirement of elementary education majors to take a methods course in physical education is supported by the results of the current study and others (Faucette & Patterson, 1990; Humphries & Ashy, 2002). By providing the content knowledge asso-

ciated with teaching physical education, the teacher has a foundation on which to base the selection of appropriate activities and provide his or her students with appropriate feedback (Faucette et al., 1990). The appropriate teaching of fundamental movement skills is crucial at an early age to maintain an individual's body weight (Booth et al., 2002), physical activity (Okely et al., 2001a), and cardiorespiratory endurance (Okely et al., 2001b). Future research should assess the elementary education majors' ability to utilize that basic content knowledge in higher levels of thinking (e.g., application, analysis, synthesis). Additional research should be conducted to determine what specific content should be required in a physical education methods course to maximize the experience for elementary education majors and their future students.

REFERENCES

- Allen, M. (2003). Eight questions on teacher preparation: What does the research say? Retrieved July 22, 2004 from <http://www.ecs.org/tpreport>.
- American Alliance for Health, Physical Education, Recreation and Dance. (2004). Obesity epidemic prompts summit. Update, July/August, 5.
- Booth, M.L., Chey, T., & Southall, J.E. (2002). Relationships between body composition and fundamental movement skills among children and adolescents. *International Journal of Obesity*, 26 (Suppl. 1), S29.
- Center for Disease Control. (2002). Obesity still on the rise, new data show. Retrieved August 1, 2004 from <http://www.cdc.gov/nchs/pressroom/02news/obesityonrise.htm>.
- Clark, J.E. & Metcalfe, J.S. (2002). The mountain of motor development: A metaphor. In J.E. Clark & J.H. Humphrey (Eds.). *Motor development: Research and reviews*, Vol. 2. (Pp. 163-190). NASPE Publications; Reston, VA.

- Darling-Hammond, L., & Youngs, P. (2002). Defining "Highly Qualified Teachers": What does "Scientifically-Based Research" actually tell us? *Educational Researcher*, 31(9), 13-25.
- Eckert, H.M. (1987). *Motor development*, 3rd ed. Indianapolis, IN: Benchmark Press, Inc.
- Faucette, N., McKenzie, T.L., & Patterson, P. (1990). Descriptive analysis of nonspecialist elementary physical education teachers' curricular choices and class organization. *Journal of Teaching in Physical Education*, 9, 284-293.
- Faucette, N., & Patterson, P. (1990). Comparing teaching behaviors and student activity levels in classes taught by p.e. specialists versus nonspecialists. *Journal of Teaching in Physical Education*, 9, 106-114.
- Gabbard, C.P. (2000). *Lifelong Motor Development*. 3rd ed. Boston, MA: Allyn and Bacon.
- Humphries, C., & Ashy, M. (2002). Frequency and nature of physical education preparation of elementary education majors. *The Physical Educator*, 59, 2-7.
- Lacy, A.C., & Douglas, N.H. (2003). *Measurement and evaluation in physical education and exercise science* (4th ed.). San Francisco, CA: Benjamin Cummings.
- National Association of Sport and Physical Education. (1998). Shape of the nation report: Most schools fail to provide physical education classes K-12. *NASPE News*, 50(Winter), 1, 14.
- National Association of Sport and Physical Education, (2002). 2001 *Shape of the Nation: Status of Physical Education in the USA*. Reston, VA: AAHPERD Publications.
- Okely, A.D., Booth, M.L., & Patterson, J.W. (2001a). Relationship of physical activity to fundamental movement skills among adolescents. *Medicine & Science in Sports & Exercise*, 33, 1899-1904.
- Okely, A.D., Booth, M.L., & Patterson, J.W. (2001b). Relationship of cardiorespiratory endurance to fundamental movement skill proficiency among adolescents. *Pediatric Exercise Science*, 13, 380-391.
- Payne, V.G., & Isaacs, L.D. (2002). *Human motor development: A lifespan approach*, 5th ed. Boston, MA: McGraw-Hill.
- Wall, S., Rudisill, M., Goodway, J., & Parish, L. (2004). A comparison of three movement settings on the development of fundamental motor skills in young children. *Journal of Sport and Exercise Psychology*, 26 (Supple.), S194.

Dr. Hart teaches at Texas Tech University.

Table 1. Means and standard deviations of the ratio of correctly identified responses.

Group	Pretest		Posttest	
	Mean	SD	Mean	SD
Elementary Methods (Full-Semester)	0.29	0.36	0.89	0.18
Elementary Methods (Half-Semester)	0.51	0.33	0.81	0.19
Control	0.34	0.29	0.54	0.26
Total	0.41	0.34	0.74	0.26

Table 2. Means and standard deviations of the response ratios for various movements.

Group	Pretest		Posttest	
	Mean	SD	Mean	SD
Elementary Methods (Full-Semester)	0.35	0.40	0.03	0.13
Elementary Methods (Half-Semester)	0.36	0.31	0.10	0.13
Control	0.37	0.30	0.41	0.25
Total	0.36	0.32	0.19	0.24

Table 3. Responses to the question: "Why are fundamental movement skills important?" Responses are listed from the most frequently listed to the least frequently listed with percentage of responses in parentheses.

Pre-Instruction

Post-Instruction

Elementary Methods (Full-Semester)

- | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • Use in everyday life (53%) • Important for all basic movements (29%) • Allow us to function/be independent (12%) • Way of transportation and communication (6%) | <ul style="list-style-type: none"> • Important for the progression of other movements/sport/activities (70%) • Use in everyday life (15%) • Important for all basic movements (10%) • Allow us to function/be independent (5%) |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Elementary Methods (Half-Semester)

- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • Use in everyday life (54%) • Important for all basic movements (26%) • Allow us to function/be independent (10%) • Way of transportation and communication (10%) | <ul style="list-style-type: none"> • Important for the progression of other movements/sport/activities (77%) • Use in everyday life (15%) • Allow us to function/be independent (6%) • Way of transportation and communication (2%) |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Control

- | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • Use in everyday life (37.5%) • Allow us to function/be independent (29%) • Important for all basic movements (21%) • Way of transportation and communication (12.5%) | <ul style="list-style-type: none"> • Use in everyday life (55%) • Important for all basic movements (21%) • Allow us to function/be independent (17%) • Way of transportation and communication (7%) |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|