

DOCUMENT RESUME

ED 254 510

SP 025 898

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 TITLE Differences between All Level Physical Education Majors and Elementary Education Majors in an Experimental Teaching Unit.
 PUB DATE 29 Nov 84
 NO 16p.; Paper presented at the Texas Association of Health, Physical Education, Recreation and Dance State Convention (San Antonio, TX, November 29, 1984).
 PUB TYPE Speeches/Conference Papers (150) -- Reports - Research/Technical (143)
 EDRS PRICE MF01/PC01 Plus Postage.
 DESCRIPTORS Academic Achievement; Comparative Analysis; *Education Majors; Higher Education; *Intermode Differences; *Majors (Students); *Physical Education; Preservice Teacher Education; *Student Teachers; Teaching Methods; *Teaching Skills; Time Management

ABSTRACT

The purpose of this study was to assess the differences between all level (K-12) physical education majors and elementary education majors with a specialization in physical education. An experimental teaching unit (ETU) with pre and posttests was used to determine student achievement, and differences between teaching groups in various criterion process variables. The entry group of all level physical education majors was compared against a group of student teachers who taught with the exact ETU. Results indicated that the two entry level groups were basically equal in overall teaching effectiveness. However, entry level physical education majors were more effective teachers than the student teacher group based on student achievement, feedback, and in assessed criterion process variables (management, activity, motor engagement and academic learning time). (Author)

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ED254510

Differences Between All Level Physical Education
Majors and Elementary Education Majors
In An Experimental Teaching Unit

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Paper presented at the Texas Association of
Health, Physical Education, Recreation and Dance
State Convention, San Antonio, Texas
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The purpose of this study was to assess the differences between all level (K-12) physical education majors and elementary education majors with a specialization in physical education. An experimental teaching unit (ETU) with pre and posttests was used to determine student achievement, and differences between teaching groups in various criterion process variables. The entry group of all level physical education majors was also compared against a group of student teachers who taught the exact ETU. Results indicated that the two entry level groups were basically equal in overall teaching effectiveness. However, entry level physical education majors were more effective teachers than the student teacher group based on student achievement, feedback, and in assessed criterion process variables (management, activity, motor engagement and ALT).

Over the past ten to twelve years the major focus in pedagogical research has been in the area of teacher effectiveness. Many of the studies have dealt with the improvement of teaching skills and/or the effect of teacher/student behaviors on student achievement (McKenzie 1976, Pieron 1982, Wurzur 1982, Yerg 1982, etc.). The subjects used in this research have mainly been student teachers and preservice interns who are engaged in either laboratory peer teaching or a public school early field experience. Within the last few years there has been a slight trend in researching the effect of early field experiences on student teachers and the effect of certain programs within a teacher preparation program on actual teaching skill attainment by its interns. The purpose of this type of research is to evaluate teacher preparation programs in the development of teaching skills and its subsequent effect on student learning. A study by Paese (1984) concluded that student interns during their first field experience had higher rates of student motor engagement, less management time, etc. than student teachers during an experimental teaching unit. Of course that study cannot make any generalizable conclusions, but does help the department from which those students are being prepared realize that student interns lose developed teaching skills if there is a large gap of time between the attainment of those skills and student teaching. Continued research in this area will lead teacher educators to some generic recommendations for teacher preparation programs. Interns cannot maintain teaching skills if they are not given the chance to continually practice and use those teaching skills, especially during last few semesters prior to student teaching. There still is a need to look at the first two years of a teacher preparation program in order to ascertain the effectiveness of that part of the program, since most research has concentrated on the final two years.

The purpose of this study was as follows: 1) to assess the differences between

all level (K-12) physical education majors and elementary education majors with a specialization in physical education during an experimental teaching unit on a novel golf task with fifth grade students, 2) to determine if a significant change occurred within each group when comparing pretest and posttest scores, and 3) to determine the level of significance between groups on a teacher process skill, and criterion process variables (management time, activity time, engaged motor, academic learning time, etc.).

Methods and Procedures

Subjects and Setting

During the study five all level physical education majors and five elementary education majors with a physical education specialization were used as subjects. There were four females and one male in each group. Each of the ten preservice interns had been involved in an elementary methods class with the same instructor and were involved in their first experience in the public schools at the time of data collection. Also, during the time of data collection all interns were midway through the five week field experience. All interns were placed in an elementary school in the central Texas area and all were assigned to a fifth grade physical education class. Class size ranged from twenty to twenty-six pupils per class with the average for each teacher at twenty-two pupils per class. All student interns were first semester juniors during the time of data collection.

Experimental Teaching Unit

The modified experimental teaching unit used for this study was the Georgia Physical Education Project (Graham, Soares and Harrington 1983). An ETU is an alternative to a large process-product studies and it has been demonstrated to be quite useful in teacher effectiveness research (Arhart 1979, Berliner and

Tikunoff 1976, Gall 1977, etc.). In a typical process-product study student learning is the outcome or product used in assessing teacher effectiveness. In this modified ETU the objective was for fifth grade students to hit a tennis ball with a plastic hockey stick into a circle which was thirty yards away. The objective was to hit the ball into the circle in as few strokes as possible.

Observations and Data Collection

Each student intern was given three days notice that they would be involved in teaching a novel golf task to his/her class. The intern was told not to discuss this with any other student intern in order to minimize teacher reactivity. All interns were told that they would have sixteen hockey sticks and twenty-four tennis balls to work with. Each intern pretested his/her class and then taught a twenty minute lesson relating to the novel golf skill. After the twenty minute lesson the class was given a posttest. During both pre and posttests students were given two attempts at the task. The objective was to get the ball into the circle in as few strokes as possible. Students were split up among the testers and were only allowed to go one at a time.

Each twenty minute lesson was videotaped and then coded for amounts of activity time, (time spent in skill practice/game play) management time, (organization) instructional time, (rules, techniques) motor engagement, (individual student practice during activity time doing motor tasks) academic learning time, (student success when performing motor tasks) and teacher verbal feedback to students.

Observations of videotapes were completed by a trained observer using the ALT-PE Observation System (Siedentop, Tousignant, and Parker 1982). Definitions of all the above categories are included in the text Developing Teaching Skills in Physical Education, (Siedentop 1983.)

Reliability

Inter-observer agreement was checked twice by having another trained observer code the videotape and then comparing results by using the scored interval method of calculation (Hawkins and Dotson 1975). Overall reliabilities on each category ranged from .80 ALT to .93 on management time for an overall reliability of .85.

Analysis

A t-test was computed on all variables between the two groups of teachers and within groups on pretest/posttest results to ascertain if any differences were significant. Average mean scores on each variable and in posttest results on each group were also compared with live student teachers who did exactly the same ETU a year prior to data collection for this study.

Results

Teacher Groups

Elementary education majors had a lower amount of instruction time and a higher amount of class activity time. Differences between groups on the above variables were significant $P < .01$. The group of teachers who were all level physical education majors had a higher rate of engaged time 41% (time spent by students actually practicing/doing a motor task) than the elementary education group of teachers 32%. This difference was also significant $P < .01$. Mean percentages in management, academic learning time, and teacher verbal feedback were very close between groups and not significant $P > .05$. The data between the two groups of teachers on selected variables is illustrated in Table 1.

Table 1 goes about here

Pretest/Posttest

An improvement from pre to posttest in the novel golf task would be a decrease in

the number of strokes per trial. The students in the classes of the all level interns were able to reduce their average strokes per trial from pre to posttest by .9 strokes. This was a significant improvement $P < .05$. The students in the classes of elementary education majors also reduced their strokes per trial in the novel golf skill from pre to posttest by exactly 1.2 strokes. This reduction was also significant $P < .01$. Table 2 illustrates this data.

Table 2 goes about here

Comparison With Student Teachers

Five student teachers who were all level physical education majors also had completed an ETU with fifth graders the previous year. This data was part of another study, but it was decided that the addition of this data would help the overall analysis of this study and this teacher preparation program. The four female and one male student teachers had at least one field experience in the public schools and one elementary methods class with the same instructor as the ten entry level interns. Student teachers had more instruction time, more management time and less activity time, engaged motor, and academic learning time than the two groups of entry level interns during their ETU. Feedback by the teachers was approximately the same for all three groups. Table 3 illustrates the differences between the student teachers and both entry level intern groups in selected variables.

Table 3 goes about here

As demonstrated in Table 2, classes of both entry level interns were able to significantly reduce their strokes per trial from pre to posttest. Student

teachers' classes also reduced their strokes per trial from pre to posttest but this reduction was not significant $P > .10$. Table 4 illustrates this data.

Table 4 goes about here

Conclusions/Discussions

Both groups of entry level student interns had approximately the same amount of management time within their twenty minute lesson. Percentages of management were at an acceptable level for both groups. The all level group of interns had slightly more than double the instruction when compared with the elementary education interns. This difference was significant. The only explanation for this is that all level physical education major has had more skill classes and were usually involved in athletics during high school, thus becoming much more technical during the lesson they taught. Both groups were taught in methods class that instruction is important, but teachers should attempt to limit instruction as long as there is sufficient feedback. The elementary education group seemed to follow this principle. The all level intern probably reverted back to the way they were taught much more than the education major. The way teaching interns were taught motor skills has a powerful influence, many times whitewashing what was learned in teacher education. Students in the elementary education group of teachers had classes involved in activity time more than the all level group. This difference of 10% was also significant, but both groups had an acceptable level of activity time within the twenty minute lesson. In a normal skill lesson at least two-thirds of all allotted time should be spent in activity and the rest of the time roughly split between instruction and management. A very important variable is the opportunity a student is given by the teacher during activity time to practice a skill (engaged motor). Even

though the interns of the all level group had less activity time, they had students engaged in practice 9% more than the elementary education group of interns. As mentioned earlier this difference was also significant. The mean difference between the two groups on ALT and feedback was approximately the same and not significant. Even though the elementary education group of interns had more activity time, the all level group were able to give students more practice time within the activity time. With feedback being the same, this explains why ALT was approximately the same between the two groups. Both groups were able to significantly reduce their students' strokes per trial from pretest to posttest, although the reduction in the classes of the elementary education interns was even more significant.

One recommendation for further study would be to have a longer ETU of forty minutes or two twenty minute lessons. If percentages remained the same for activity time, engaged, motor, and feedback in a longer ETU, ALT would more than likely be higher in the classes of the all level group. This could also have led to more significant results on the posttest. Another suggestion is to do another posttest at least two weeks after the ETU and first posttest. This would demonstrate the long term effects of teaching teacher process skills, etc.

What is quite interesting was the comparison of the two entry level groups of interns with a group of student teachers who completed the same ETU. When comparing the student teachers with the entry level groups, the student teachers had significantly more time spent in management (organization) and less time in activity, less time in student motor engagement and ALT. The student teachers' classes also reduced their strokes per trial, but this reduction was not significant.

When just comparing the two entry level groups, one might suspect that the all level majors would be more effective teachers than the elementary education majors at this point of teacher preparation. During approximately the first 2 1/2 years the all level major has had more skill classes, more discipline oriented classes, etc. than the elementary education intern, so why were they equal in teaching effectiveness? It is the contention here that the courses taken and experiences during the first 2 1/2 years of teacher preparation did not make a difference in teaching effectiveness. Most major/minor skill classes do not teach interns how to teach an activity. Discipline oriented courses such as kinesiology, motor learning, exercise physiology, etc. do not teach an intern how to teach. In these preparation programs interns did not have any real pedagogical courses until the first methods class. This is why both groups came into the methods class field experience at an equal level of teaching ability, and performed roughly the same in the ETU which was at the end of the methods class field experience.

Another question is why were the student teachers the least effective of all three groups when most would feel that they should be the most effective? In this teacher preparation program as in many others, interns spend anywhere from six months to one year prior to student teaching without any practice of teaching. A regression in teaching skills and effectiveness should be expected if student interns do not continue to practice teaching skills and have these skills monitored by trained teacher educators right up to student teaching. Another reason student teachers decrease in teaching effectiveness might be because they begin to teach like their cooperating teachers who many times are less than effective teachers.

The utility of an ETU has been demonstrated in the professional literature. In fact, the Ohio State University is considering having student teachers do an ETU at the beginning of their student teaching experience. This ETU which involved different groups of interns in a teacher preparation program is a valuable assessment tool for a teacher education program. If other teacher education programs did similar studies some general recommendations could be made for teacher preparation. One major recommendation from this study is that interns must be given more chances to practice teaching skills (labs, field experience, etc) than just one or two methods courses. These experiences must be spread over four years with trained teacher educators. Of course there is a need for discipline oriented courses within a teacher preparation program, but they should not limit the amount of time student interns spend in the actual practice of teaching. Ask yourself two questions. A student intern in a teacher preparation program is learning to become a teacher, thus in order to become a teacher, what must he/she practice? Is five to fifteen hours prior to student teaching enough time spent in the actual practice of teaching? Improvements in teacher preparation programs are warranted!

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Table 1
Comparison of Selected Variables
Between Teacher Groups

Variable	Group	Mean	SD	t	p
Management	All Level	17%	7.60	.576	.59
	Elem. Ed.	16%	4.56		
Instruction	All Level	17%	8.16	5.04	.01
	Elem. Ed.	8%	3.26		
Activity	All Level	66%	3.69	6.06	.01
	Elem. Ed.	76%	7.25		
Engaged Motor	All Level	41%	3.69	6.16	.26
	Elem. Ed.				
ALT	All Level	16%	4.01	1.24	.26
	Elem. Ed.	18%	6.39		
Feedback	All Level	28%	12.6	.421	.68
	Elem. Ed.	27%	10.0		

Table 3
Comparison of Selected Variables
Between Groups With Student Teachers

	Management	Instruction	Activity	Engaged	ALT	Feedback
	Motor					
ALT Level	17%	17%	66%	41%	16%	28%
Elem. Ed.	16%	8%	76%	32%	18%	27%
Student Teachers	27%	21%	53%	19%	13%	27%

Table 4
Comparison of Pre/Post Scores
Within All Teacher Groups

	Pre	Post	Net Gain	t	p
All Level	6.1	5.2	-.90	2.77	.05
Elem. Ed.	7.8	6.6	-1.2	4.71	.01
Student Teachers	6.2	5.5	-.70	1.73	.16

Table 2
Comparison of Pre-Post Scores
Within Teacher Groups

Variable	Group	Pre/Post	Net Gain	t	p
Pre to Post	All level	6.1/5.2	-.9	2.77	.05
	Elem. Ed.	7.8/6.6	-1.2	4.71	.01