

Preservice Physical Education Teachers' Use of Reproduction and Production Teaching Styles

Panos Constantinides and Orestis Antoniades

ABSTRACT

Having Mosston's (1966) and Mosston's & Ashworth's (2008) "Spectrum of Teaching Styles" as a guiding tool, research on teaching styles in physical education has been rising for over 50 years. The spectrum offers a variety of teaching styles to be used by teachers, which fall into two broad categories: the rather teacher-centered reproduction styles and the rather student-centered production styles. This paper is part of a larger scale study for teaching effectiveness, in which teaching components were examined. The purpose of this study was to investigate preservice teachers' preferences of teaching styles during student teaching in public schools. For that purpose, a convenient sample of 16 students of a private University in Cyprus, participated in this study. All students took physical education pedagogy class I and then physical education pedagogy class II, which included student placement in secondary public schools for student teaching purposes. Students were taught Mosston's and Ashworth's Spectrum of Teaching Styles in depth, with various examples, teaching style video analysis and workshops, to ensure that all possessed the knowledge and skills to incorporate any teaching style in their teaching. Each student was placed in three different secondary schools, to ensure that he/she would be able to teach in any school context with various circumstances. The investigators observed all students according to the schedule that was prepared in collaboration with school principals and physical education teachers in the participating schools. The investigators took field notes for the application of the teaching styles, as well as for the school context. In addition, informal interviews were conducted with students after each class. Data were analyzed via constant comparison and analytic induction methods. The results revealed three important themes: a) Student teachers preferred mostly teaching styles from the reproduction category, such as the command and the practice style, especially during warm up or children's practice time, b) Student teachers incorporated teaching styles from the production category during introduction or final assessment of the class, such as the guided discovery or the convergent discovery styles and c) There were times during practice, when some students used a mixture of teaching styles, jumping from one style to the other, according to the activity that would follow. The results demonstrated that preservice teachers prefer the utilization of reproduction teaching styles over production teaching styles. Their personal beliefs seem to impact the usage of any style. In addition, discipline, coaching experience, time management, the school context and the content to be taught were factors affecting their preferences, usually in favor of the reproduction teaching styles. However, they should be encouraged to use production teaching styles as well in their teaching, as a means to help children develop in all domains of learning: psychomotor, cognitive and affective. Perhaps, asking preservice teachers to incorporate teaching styles only from the product category in one of their student teaching classes, would help them feel more confident towards that and would allow for more children-centered classes.

Keywords: Middle School, Physical Education Pedagogy, Student Teaching, Teaching Styles.

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I. INTRODUCTION

Teaching physical education is a complex task (Graham,

2008) that requires teachers to possess both content knowledge and pedagogical content knowledge (Constantinides & Silverman, 2018). Physical education is

part of the school curriculum designed to help kids develop motor skills, knowledge and behaviors of healthy active lifestyle, physical fitness, sportsmanship, self-efficacy, and emotional stability (Constantinides *et al.*, 2013; NASPE, 2013). It offers a great opportunity to children to engage in developmentally appropriate physical activities designed specifically for them to develop their fitness, motor skills and health (Sallis *et al.*, 2003; Robinson & Goodway, 2009; Robinson, 2011). To be able to do that in schools, teachers use Mosston's spectrum of teaching styles (Mosston, 1966, 1981; Mosston & Ashworth, 2002, 2008), which provides a theoretical framework of a variety of teaching methods that teachers may select and use to teach the content in physical education. The theory over the spectrum is the notion that the teaching-learning process consists of a chain of decision-making, according to the "anatomy of the teaching style": There are three sets of decisions to be made: a) decisions before class (planning), b) decisions during class (implementation), and c) decisions after class (evaluation) (Mosston & Ashworth, 2002, 2008). According to whom these decisions will be made from, the teacher or the students, different teaching styles apply. Mosston and Ashworth (2002, 2008) have identified two clusters of teaching styles: a) the reproduction cluster, a more teacher-centered cluster (first 5 teaching styles) where students typically reproduce the received information or skills delivered by the teacher and is based on memory recall, and b) the production cluster, a more student-centered cluster (the last 6 teaching styles) where students are stimulated to produce knowledge or skills, since it is based on discovery (Goldberger *et al.*, 2012). All styles are used accordingly by the teachers to help kids develop in all domains of learning: the psychomotor, the cognitive and the affective. In physical education teacher education (PETE) programs, teaching styles are analyzed, discussed in class and used in workshops, so that students get the knowledge and skills to use them when teaching. In addition, for sports classes, gymnastics, swimming and dance, students practice the methodology of teaching the material, using a variety of teaching styles accordingly. Then, students are usually placed in schools for student teaching purposes and are assessed by faculty members, who are responsible to provide feedback to each and all of them.

Previous studies during the last decades and so have examined the relationship of the reproduction cluster of teaching styles with learning outcomes (Chatoupis, 2010). When comparing the inclusion style with the practice and self-check teaching styles, Jenkins and Byra (1996) suggested that the first one promotes skill retention more effectively. Similarly, the self-check teaching style was found to be more effective, as opposed to the command teaching style, when teaching tennis skills (Patmanoglou *et al.*, 2008). In addition, the implementation of the practice teaching style helped the students learn better in basketball, compared to the reciprocal teaching style (Alhayek, 2004). Interestingly, the divergent discovery style in a dance class was found to promote critical thinking and dance skills (Chen & Cone, 2003).

In a different dimension, several studies explored the relationship of student motivation with Mosston's spectrum of teaching styles, revealing that some teaching styles may motivate students to participate in class, more than other teaching styles. For instance, the inclusion teaching style was

found to promote the intrinsic motivation more than the practice style (Goudas *et al.*, 1995). Similarly, the reciprocal and the guided discovery styles were found to promote more a motivational class climate than the command and the practice styles (Morgan *et al.*, 2005). Importantly, literature also demonstrated that the use of the reciprocal style led in higher levels of student task orientation (Digelidis *et al.*, 2003).

Previous research findings revealed that physical education teachers more likely use teaching styles from the reproduction cluster (Cothran *et al.*, 2005; Jakkola & Watt, 2011; Kulina & Cothran, 2003; Sympass *et al.*, 2016), however, they perceive teaching styles from the production cluster to be equally or more beneficial for their students, than teaching styles from the reproduction cluster.

An explanation given for predominately using the reproduction teaching styles in physical education is because of the emphasis on the psychomotor domain of learning (Hey *et al.*, 2016). This ideology, however, seems to be shifting more towards the production (or student-centered) approach or a mixed approach (using styles from both clusters). This might be due mainly to an increased focus on the simultaneous development of all three domains of learning: the psychomotor, cognitive and affective domains of learning, as opposed to just the psychomotor domain (Hey *et al.*, 2016). In addition, different teaching styles can be matched to specific content in order to meet desired curricular outcomes (Syrmpas *et al.*, 2019). A second explanation is that teachers might not feel confident in their abilities to use teaching styles from the production cluster, either because they give more value to the psychomotor domain of learning or just because they want to work in their "safety zone", that is, the use of teaching styles that they have been using comfortably for many years (Constantinides & Silverman, 2018; Constantinides *et al.*, 2013; Parker & Curtner-Smith, 2012).

During the school year 2009-10, the Cypriot ministry of education, culture, youth and sports introduced a new school curriculum for all ages in physical education (MOEC, 2009). The aim of the new curriculum was multi-targeted: knowledge and acquisition of fundamental motor skills and strategies, sports learning skills and strategies, alternative ways of exercise, development of positive attitudes towards physical education and physical activity, fitness development and lifelong learning for continuous engagement in physical activity. As in other countries, PETE programs in Cypriot universities allow college students to get familiar with the content of the school curriculum offered by the ministry of education, culture, youth and sports, distinguishing what's appropriate to be taught at each grade level. For example, what shall students learn as far as volleyball in kindergarten, in elementary or secondary school. The curriculum sets specific learning objectives, usually stating "Students should be able to..." for skill learning, concept learning, etc. Learning the content of the curriculum, however, does not guarantee effective school practices for any physical education teacher (Constantinides *et al.*, 2013). In PETE programs preservice teachers begin to develop what experts call pedagogical content knowledge (PCK). Generally speaking, components of teachers' knowledge form around the knowledge categories of students, content, school context,

and pedagogy. These components interact to form PCK (Grossman, 1990; Marks, 1990; Shulman, 1986, 1987). Students need to learn how to teach the material in a way that will be fun for students. and will have them engaged in physical activity, appropriate for their age and their abilities, for an appropriate amount of time (Constantinides *et al.*, 2013).

One of the most important parts of planning a physical education class is teachers' decision as far as which teaching method will be used to teach a skill better. Teachers may select a variety of teaching methods for each class. Good knowledge of teaching methods allows teachers to present their material efficiently, according to their best knowledge and skills, enabling students to gain appropriate movement behaviors (Pangrazi, 2007). College students are introduced to the spectrum of teaching styles and learn how to use each style appropriately. Then, they practice these methods in workshops and finally, they are placed in public schools for student teaching purposes. Since these students will be teaching in schools in the future, it would be interesting to find out the teaching methods they prefer to use. Therefore, the purpose of the study was to investigate the use of reproduction and production teaching styles in classes of preservice physical education teachers.

II. METHODS

For the purpose of the study, 16 preservice teachers (11 men and 5 women) from a private university in Cyprus were recruited as a convenient sample, to participate in this study. A student was completing their 3rd year of studies. Students had already completed a methods class and were taking the second one, which included placement in public secondary schools. Data collection took place in the Spring 2022 semester. Students were asked to prepare their classes using any teaching method their preferred from the spectrum of teaching styles. Students were free to choose any topic to teach. In addition, a lesson plan was required for each class students were about to teach. Upon receiving permission from the ministry of education, culture, youth and sports, school principals and teachers were asked to sign a consent form and then, a schedule was prepared with specific dates and times that student teachers would teach their classes, without interrupting the regular school program. The current physical education teachers there were very helpful. They gave information about the school facilities, the available equipment, the school's timetable and the number of the students in each class, to help them prepare themselves better. Student teachers had no experience before in teaching physical education in schools. All of them, however, were athletes on track and field, in martial arts, fitness or in different sports and had experience as athletes, or in coaching little kids. Coaching and teaching though, are two different things. Student teachers were given their first field experience, to be able to apply their knowledge and developed skills in school settings. The investigators observed each student accompanied by the physical education teacher and collected data, by observing and recording the

type of the teaching methods used by student teachers, as well as components of effective teaching such as introduction of the lesson, warm up, presentation of skills or activities, student-teacher interaction for feedback, encouragement, reward, etc., cool down, final assessment and closure of the class. As this study is part of a larger scale study, the focus here was to identify student teachers' preferences in either reproduction or production teaching styles, used in their classes. Beyond observation of each class taught, data collection included informal interviews with each student teacher, right after class. Student teachers were asked to reflect on their teaching, for example, if they felt that their teaching was effective, why they preferred the teaching style used if they would use a different teaching style next time, the factors that affect their decisions in the use of the reproduction or production teaching styles, the problems that occurred during teaching, etc.

III. RESULTS

The results of the current study revealed that student teachers preferred to use teaching styles mostly from the reproduction cluster in their classes rather than the production cluster. Observing their physical education classes, the researchers identified several parts of the class, such as introduction, warm-up, content delivery of the skill or activity (explanation & demonstration), cool down, final assessment, and closure of the class. Student teachers in this study have used teaching styles from the reproduction style in all parts of the class, with exception of the final assessment where most of them have used production teaching styles. Table I provides a picture of the teaching styles used in their middle school student teaching classes.

For the beginning of the class (introduction) with the exception of one participant, all student teachers used the command style to introduce the students to the content of the class. ST5 has used the guided discovery style for the introduction part. to teach the content of the lesson. For the warmup part, almost all student teachers used the command style. A different teaching style was observed in the classes of students ST1, ST8 & ST14. These students preferred the practice style. To deliver the content of the class, most student teachers have used the practice style, however, some of them preferred the reciprocal style (ST4 & ST10) whereas others have used the self-check style (ST13 & ST15). For the cool-down part of the class and the closure, all student teachers used the command style. The difference in student teachers' preferences was observed during the final assessment of the class, just a few minutes before the end. In this part, most student teachers have used teaching styles from the production cluster, although, some of them have used teaching styles from the reproduction cluster. In particular, the teaching style most seen was the guided discovery, followed by the command style. Each student teacher was observed three times. Each one of them has used the same teaching styles that were used in his/her previous student teaching classes (as seen in Table I).

TABLE I: TEACHING STYLES USED IN STUDENT TEACHERS' CLASSES

TEACHER	SEX	INTRO	WARM UP	CONTENT DELIVERY	COOL DOWN	FINAL ASSESSMENT	CLOSURE
ST1	M	Command	Practice	Practice	Command	Command	Command
ST2	M	Command	Command	Practice	Command	Command	Command
ST3	F	Command	Command	Practice	Command	G Discov	Command
ST4	M	Command	Command	Reciprocal	Command	Command	Command
ST5	M	Discovery	Command	Practice	Command	G Discovery	Command
ST6	M	Command	Command	Practice	Command	G Discovery	Command
ST7	M	Command	Command	Practice	Command	Command	Command
ST8	F	Command	Practice	Practice	Command	G Discovery	Command
ST9	M	Command	Command	Practice	Command	Command	Command
ST10	M	Command	Command	Reciprocal	Command	G Discovery	Command
ST11	M	Command	Command	Practice	Command	G Discovery	Command
ST12	F	Command	Command	Practice	Command	G Discovery	Command
ST13	F	Command	Command	Self-check	Command	Command	Command
ST14	M	Command	Practice	Practice	Command	G Discovery	Command
ST15	M	Command	Command	Self-check	Command	Command	Command
ST16	F	Command	Command	Practice	Command	G Discovery	Command

IV. DISCUSSION

The results of this study are aligned with the results of previous studies (Bryant & Curtner-Smith, 2008, 2009; Constantinides *et al.*, 2013; Curtner-Smith *et al.*, 2001; Hincă, 2020; Sympas & Digelidis, 2014; Sympas *et al.*, 2017) which have shown that preservice physical education teachers prefer to use the reproduction teaching styles in their classes. Although their effort was to involve their students in the teaching and learning process as much as they could, making their teaching style more children-centered, during most of their class time, the production teaching styles dominated the production ones. On one hand, student teachers mentioned in their informal interviews that they felt more comfortable using the reproduction teaching styles, such as the command, the practice, and the reciprocal. Although they were aware of the production teaching styles and they knew how to apply them in their student teaching classes, the fact that they didn't know the students at each school they were placed in very well, seemed to be a limiting factor in using them. For example, Maria (we use pseudonyms for all participating pre-service teachers) said that not knowing the students' abilities, it seems safer to use reproduction teaching styles such as the command or the practice style. In a similar sense, Nickolas stated that the production styles require more knowledge from students in physical education and information for the teacher as far as what students are able to do at that point, therefore, it would be risky to use them. Christina said that she wanted to move on the so-called "safety zone", meaning that she has chosen the practice style during teaching the content of the class because she experienced that style more during her school years and she liked it a lot.

Participating in preservice teachers' personal beliefs may have affected their decisions to use mostly reproduction teaching styles. This finding is aligned with the results of previous studies (Curtner-Smith, 1999) which suggest that the limited use of the production styles may be due to teachers' prior personal beliefs, probably due to the influence of pre-existing perspectives of physical education pedagogy and in the limited period of study for the production styles, which are rather new to physical education majors.

Some student teachers' choices were affected by their coaching experiences. For instance, Andy and some other student teachers mentioned that the command and the

practice style were very convenient for them to use because they usually use them in the afternoon when coaching. Since it works for the kids in the club they work for, why not use it for school kids as well! Similarly, Maria said that she incorporates the command or the practice style in coaching and she feels she's an effective coach. She enjoys coaching and according to kids and parents, she's a very good coach. In that sense, she believes she could do the same when teaching in school.

Similar results were found in previous studies (Byra, 2000; Capel, 2007; Garn & Byra, 2002). An explanation to that is the fact that all student teachers are athletes or coaches, and their decisions may have been affected by their athletic or coaching experiences. In that sense, one may assume that skill learning and physical development may have been the top priority in their classes. According to their statements, however, preservice teachers had set goals for all domains of learning and for the psychomotor.

A number of student teachers highlighted the issue of discipline. "For some of us, the reproduction styles help us control the class and everything around it", Sissy said. Similarly, John stated that it was easier for him to keep the students focused on class activities. Paul stated that the use of the reproduction teaching styles helps him keep students on track: "Several times I tried to incorporate the self-check or the reciprocal teaching style, however, students make noise, they move back and forth for no reason, and sometimes they don't take it seriously." Another student teacher, Mark, who is also a Martial Arts athlete, believed that discipline is a major factor for anything you want to accomplish: "If you want your students to pay attention to what's running in class, then you need to have discipline. When discipline is based on student-teacher respect, then you can work better in class. Maria, also, stated: "We've seen these styles, they work for so many years, we are more effective in our teaching when using them, we see results, so we use them".

Previous studies revealed that discipline was found to be an important factor in physical education teachers' decision-making for a teaching style (Cothran & Kulinna, 2008). Indeed, participants in this study perceived discipline as a key component for a successful class.

Time management seems to be another important factor when student teachers make decisions for teaching styles, in their classes. Almost all of them talked about the available

time. Christina said: “I thought I had plenty of time, but it took me forever to organize the students for practice”, Mark stated: “You practice at home and stick to the schedule, however, things happen, like students asking for explanations or for additional information. Until you realize, time is gone and you feel the pressure that you did not teach them anything yet!” Paul added on that: “You want to count your abilities in teaching school physical education, but time is always an obstacle to your lesson plan. When students ask questions and then a question follows another and another, then time is passing by without realizing it!”.

A number of student teachers discussed the available class time from a different point of view: “You prepare yourself for a 40-minute lesson, but it takes 5-6 minutes for the students to change and at the end, you have to give them 5 minutes at least to change again and prepare for the next class. What’s left is usually half an hour. So, you have to skip some of the activities in your lesson plan.” Joseph said. Similarly, Maria added that in addition to the loss of time in the beginning and at the end of the class, in case a student gets hurt, you have to stop the class and check if the student is all right. “It’s physical education. It happens! That is translated to more time loss and less material to teach!” Mark pointed out that due to the limited total time of the class, he believes the reproduction teaching styles are more effective in saving time, when learning skills or games. The above factor (time management) is aligned with Cothran and Kulinna’s (2008) and Rink’s (1996) findings that time management influences physical education teachers’ decision to reproduction styles. Most of the per-service teachers reported that the reproduction approach assisted them to facilitate control of class and therefore time management and appropriate student behavior.

All students pointed out that the content to be taught was another factor that affected the choice of the teaching style they were about to use. For example, some student teachers have taught fitness. They came prepared to teach their material in stations, having a number of activities which students had to execute, rotating from station 1 to station 2, and so forth. That pictures the practice style! Organizing the students in groups of 2-4 (according to the number of students in each class and the planned activities) student teachers managed to teach fitness in a fun way. A few of them have used music and a loud timer to give the student the start and the stop signal for each activity in each station, which made it even more fun!

Some student teachers who planned to teach skills such as the free shot in basketball, or the overhead pass in volleyball, decided to use the reciprocal or the self-check style. Paul stated that the reproduction teaching approach is the best teaching method, although he understands that students could also benefit by the use of production teaching styles. He employs teaching styles from the reproduction cluster, avoiding many times the command style, because he believes students who work in pairs or by themselves may learn better and they get to be more active. Maria stated that providing students with some kind of autonomy in class, empowers them and encourages them to work and learn. Similarly, John mentioned that students feel that you can trust them, which works many times on their benefit. In addition, it makes them more responsible on what they do.

When student teachers were asked if they would teach the same class using a different teaching style, especially from the production cluster, they all supported their style selection. For example, Andy stated: “I feel I can teach my students effectively using reproduction teaching styles. I understand that production teaching styles may also help a teacher be effective, however, the production ones work perfectly for me. I see all my students willing to participate, I can tell the class is fun for them, even for the low skilled students, so why moving from the reproduction to the production teaching styles?” In addition, Christina mentioned: “I know that the reproduction teaching styles are more teacher-centered methods of teaching. However, I always involve my students in the teaching and learning process by asking questions, asking their opinion, having short discussions, asking them to assess their effort and so forth. So, why change something that I’m good at, to something else?” Sofia replied with a question: “What’s the target here? Student learning. All teachers do the best they can for that. Obviously, they are more comfortable with using reproductive teaching styles. No one is negative about the production teaching styles, however, if the target is student learning and you see it happening in your class, why so much noise about the production teaching styles?” In a similar sense, Mark stated: “I see all my students participating with a smile. I see them learning not only exercise skills but also so-called soft skills such as critical thinking, problem solving, decision making, etc., even with reproduction teaching styles. They always participate in the teaching and learning process with one way or another. They know I’m always there for them. To help them, encourage them, support them and reward them. Why change that to something else?”.

Other student teachers replied similarly, supporting the reproduction teaching styles they have used in their classes. Although all of them understand that students may benefit by the use of production teaching styles in their classes, their teaching style preferences would not change dramatically.

This study was the first attempt to investigate Cypriot preservice physical education teachers’ preferences in using reproduction or production teaching styles in their classes. According to the observations and preservice teachers’ informal statements, a number of factors seem to determine which teaching style the participants believed would help their students learn better. First, their personal beliefs on teaching styles. Reproduction teaching styles seem to be used more often in their classes, as opposed to production teaching styles, however, it was obvious during the observations that all participating student teachers made a grade effort to involve their students in the teaching and learning process. Student teachers have used many ways for that, such as asking questions, asking for their opinion, having short discussions, etc. Student teachers were not only interested in promoting motor skill (psychomotor domain of learning), but also critical thinking, decision making, problem solving (cognitive domain of learning), as well as cooperation, respect, understanding, helping each other (affective domain for learning). Although using mostly the reproduction teaching styles, they had set goals for all domains of learning and they have worked so that their students would reach these goals.

V. CONCLUSION

The learning outcomes of the existing school physical education curriculum demand the implementation of teaching styles from both the reproduction and the production clusters (Digelidis *et al.*, 2006; Kulinna & Cothran, 2003), however, pre-service physical education teachers tend to rely on the reproduction teaching approach in their classes. Probably, the physical education teacher education programs (PETE) may need to provide more time in analyzing and practicing the production teaching styles, so that students will get more opportunities to successfully deliver the production teaching methods. Preservice teacher's perception may change only if they experience the delivery of a successful and efficient class (Guskey, 2002). In addition, student practice in schools may need to be re-examined so that preservice teachers will get the opportunity to use teaching styles from both clusters, to better prepare students for the teaching challenges of the 21st century.

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