

TEACHING STYLES IN PHYSICAL EDUCATION

Teachers' Beliefs, Perceptions, and Use of Reproduction and Production Teaching Styles in
Physical Education

A Synthesis of the Research Literature

A Synthesis Project

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Abstract

Historically, Physical Education (PE) teachers have utilized traditional teaching styles for PE instruction. There has been a growing emphasis over the past 20 years, however, for teachers to utilize a variety of teaching styles in PE in order to meet National and State standards along with goals and objectives of learning in the psychomotor, cognitive, and affective domains. This synthesis, then, reviewed literature regarding teachers' perceptions and beliefs about, and intentions to utilize both reproduction (teacher-centered) and production (student-centered) teaching styles in PE. The three research questions used for this synthesis include: (a) what are teachers' perceptions relative to the different teaching styles used in PE, (b) what are PE teachers' beliefs about reproduction and production teaching styles and their relationship to the content being taught, (c) do intended curricular goals across the three domains of learning influence teachers' choices of particular teaching styles for instruction? Data for this synthesis was collected using EBSCOHOST (found on The College at Brockport's Drake Memorial Library online research website) and Google Scholar search engines. Key words in SPORTDiscus and the Google Scholar search engine were utilized to find 10 studies that focused on the synthesis's purpose and research questions. An article grid was composed with data from each of the articles that made up the critical mass. Results influenced three key points that should be taken away from this synthesis: PE teachers prefer the utilization of reproduction styles over production styles; PE teachers' beliefs about teaching styles impact which teaching styles they implement; and, PE teachers need to increase the usage of production teaching styles as a means to develop not only psychomotor goals in the PE curriculum, but cognitive and affective goals as

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well. Administrators and colleges can use this information to assist teachers in learning how to implement and utilize the different teaching styles.

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Chapter 1

Introduction

Picture this. A physical education teacher is teaching a dance unit to a class of high school students. For one class, the Physical Education (PE) teacher shows the students a dance that is popular and has the steps and moves already determined so the students follow along. For another class, the teacher uses the same song, but allows the students to work in groups to create their own dance routine. The difference between these two scenarios is the teaching style used by the physical education teacher.

Parsak and Sarac (2020) describe teaching styles as the way in which teachers teach the content knowledge to students. There has been a growing emphasis on the utilization of different teaching styles in education generally, and especially in physical education (Chatoupis & Emmanuel, 2013). Knowledge surrounding teaching styles in physical education has evolved over time, and; today, there is a plethora of both research and practitioner-oriented writing focusing on the different teaching styles and their benefits to both teachers and students (Chatzipanteli & Dean, 2020).

According to Chatoupis (2018), the “Spectrum of Teaching Styles” - as first posited by Mosston (1966) and later by Mosston and Ashworth (2008) -, has been a guiding tool in the use of research on teaching styles in physical education for over fifty years. The spectrum consists of eleven teaching styles which fall into two broad categories: either reproduction styles (i.e. more teacher-centered) or production styles (i.e. more student-centered). The transition from one category of teaching style to the other – and between styles within these categories - represents a

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shift in the decision-making roles of both the teacher and the student (Chatoupis & Emmanuel, 2013).

The reproduction styles include Mosston's command, practice, reciprocal, self-check and inclusion styles (Chatoupis, 2018). The purpose of reproduction styles is for students to replicate motor and sport-specific movements, skills and knowledge (Parsak & Sarac, 2020). The teacher chooses the subject matter, indicates learning conditions and defines criteria for objectives in physical education (Chatoupis, 2018). In these reproduction teaching styles, it is the teacher making the majority of the instructional decisions (Chatoupis & Emmanuel, 2013). Benefits of reproduction styles include more teacher control (potentially resulting in less management time), reduction of errors, and more specific feedback for students. Drawbacks of reproduction styles include decreased student engagement and decision-making by students (Chatoupis, 2018).

On the other hand, the production styles include the guided discovery, convergent discovery, divergent discovery, learner-designed individual programs, learner-initiated style and the self-teaching styles (Chatoupis, 2018). The purpose of production styles of teaching is for the students to discover new knowledge along with an emphasis on more decision-making on their part (Parsak & Sarac, 2020). Production styles require more student engagement in cognitive aspects of learning such as problem solving, inventing, comparing, contrasting, and synthesizing (Chatoupis, 2018). In a production teaching style, it is the student making the majority of the instructional-related decisions (Chatoupis & Emmanuel, 2013). Benefits of production styles include increased student engagement and decision-making by students. Drawbacks of production styles include more student control (less time for activity), more errors, and less specific feedback for students (Chatoupis, 2018).

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Hey, Lovett, Church and Hey (2016) describe how reproduction (or teacher-centered) teaching styles have been used predominately in physical education due to an emphasis on the psychomotor component of learning. This ideology, however, seems to be shifting more towards the production (or student-centered) approach or a mixed approach (uses styles from both categories). This is due mainly to an increased focus on the simultaneous development of student learning outcomes in the psychomotor, cognitive and affective domains of learning, as opposed to just the psychomotor domain (Hey, Lovett, Church & Hey, 2016; Society of Health and Physical Educators of America, 2013). There is also an understanding that not all students will receive optimal learning or are motivated to be physically active when just one single style is used by teachers for instruction (Hey, Lovett, Church & Hey, 2016). Additionally, different teaching styles can be matched to specific content in order to meet desired curricular outcomes (Sympas, Chen & Pasco, 2019). Therefore, it is crucial to gain a better understanding of the variety of teaching styles in physical education in order to ensure the needs of all students, and the goals of the P.E. curriculums are being met (Hey, Lovett, Church & Hey, 2016).

Purpose

The purpose of this synthesis project is to examine the teaching styles (i.e. reproductive and productive) used by physical educators in the K-12 and collegiate settings in order to determine how teaching styles impact student learning in each of the three domains.

Research Questions

1. What are teachers' perceptions of how different teaching styles used in Physical Education impact student learning?
 - a. Do PE teachers prefer one set of styles (or one specific style) over another?
 - b. What are some factors that might influence these preferences?

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2. Does the content being taught influence the teacher's decision to utilize a particular teaching style?
3. How do the teaching styles used in Physical Education impact students' learning in each of the three domains?

Operational Definitions

1. Teaching styles- the ways in which teachers teach the knowledge to students (Parsak and Sarac, 2020).
2. Reproduction styles (teacher-centered) - teachers lead instruction and make most of the decisions (Parsak and Sarac, 2020).
3. Production styles (student-centered) - emphasizes the construction of knowledge by students and their active involvement in the decision-making process (Parsak, and Sarac, 2020).

Assumptions

1. It's assumed that all subjects in the studies involved in this synthesis answered the questionnaires and surveys truthfully.
2. It's assumed that all participants in the studies involved in this synthesis obeyed the rules, regulations, and protocols developed by the researchers.
3. It's assumed that all instruments and data analyzing software used for data measuring and analyses are valid and reliable.

Limitations

1. In several studies, only one or two lessons were observed. So, it is difficult to say that teachers tend to use reproduction styles without more observation time.

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2. Many veteran teachers may have limited or no experience in production teaching styles due to personal experiences and traditional methods.

Delimitations

1. All articles used were written within the last decade (2010-2020).
2. All articles are peer reviewed articles.
3. Most studies were conducted in Europe

Chapter 2

Methods

The purpose of this chapter is to present the process used to gather the research that pertains to the utilization of reproduction and production teaching styles in Physical Education (PE) and their impact on student learning. The sections which make up the Methods chapter include data collection, data coding, and data analysis.

Data Collection

Thirteen studies selected for this paper were located by utilizing the EBSCOHOST search engine. SPORTDiscus was used to find relevant articles related to the topic of teaching styles in Physical Education. The first search in SPORTDiscus found 1,584 articles using the terms “teaching styles” and “physical education”. The search was then limited to peer reviewed articles published between the years of 2010 and 2020. These parameters reduced the number of articles down to 933. Of these 933 articles, 100 articles were reviewed to determine if they were relevant to the research questions of this synthesis. The search ended after only 100 articles due to articles being repeated and a majority of the articles having no relevance to the topic. Out of 100 articles, 13 articles were downloaded and saved. From these 13 articles, nine were found to be relevant and were used towards the critical mass that made up a majority of the synthesis paper. Four articles were deemed relevant for background information of the synthesis, but were not included in the critical mass because they did not fit the criteria.

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One study was selected for this paper by utilizing the search engine of Google Scholar. The first search in Google Scholar consisted of the key words “teaching styles” and “physical education”. The key words were put into quotation marks as shown. This search yielded 9,030 search results. Another key word was added to the search. The key word was “spectrum” and this yielded a reduced number, to 2,480 articles. This search was then limited to the year range of 2010-2020. These parameters further limited the number of articles to 2,480. Of these 2,480 search results, the first 100 articles were reviewed to see if they were relevant to the research questions for this synthesis. The search ended after 100 articles due to the lack of relevancy to the topic and articles being repeated. Out of the 100 articles searched, only one was found to be relevant and used towards the critical mass that made up the synthesis paper.

One study was selected for this paper by utilizing Google Search. This search consisted of key words “National standards in physical education” and yielded 620,000,000 results. The first result was chosen as it contained the information needed for the synthesis.

For an article to be included in the critical mass, it had to be a data-based research study in a peer-reviewed journal between the years of 2010 and 2020. Another parameter the articles had to have to be included in the critical mass was the relevancy to one of the research questions: (a) teachers’ perceptions of teaching styles on student learning, (b) the content being taught to influence a teaching style and (c) the teaching styles impact on student learning in the three domains.

A total of ten articles that meet all of the requirements needed to be included in the critical mass of this paper. Some articles were excluded because the research they contained was not relevant to the topic and could not be included in the critical mass.

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Articles for this synthesis were obtained from the following peer reviewed academic journals: *Journal of Physical Education & Sport*, *International Journal of Physical Education*, *Journal of Human Sport & Exercise*, *Journal of Teaching in Physical Education*, *European Physical Education Review*, and *Physical Education*.

Data Coding

The information gathered for this synthesis underwent a two-step process to make the data clear and easily accessible. The first step included composing an article grid. The second step consisted of taking information from the article grid and putting it into the synthesis paper. The articles approved for the critical mass were put into an article grid where the full reference, purpose, rationale, participants, methods, findings, and recommendations can all be found (refer to Appendix A). The purpose of this article grid was to have all of the information in a single area to refer to when needed. The complete article grid includes the following sections: (a) APA citation of the article, (b) the purpose of the article, (c) methods and procedures, (d) data analysis, (e) the findings, (f) the discussion and recommendations for future research.

Data Analysis

There are ten articles in the critical mass. Of the 10 studies, seven reflected quantitative methods, one study qualitative, and two studies used mixed methods. The quantitative studies utilized questionnaires and surveys to collect data. Several of these studies used ANOVA, MANOVA, Kruskal-Wallis, and several different types of software to analyze the data. The qualitative study included an in-depth interview to collect data. The mixed method study incorporated mostly quantitative data, but also utilized qualitative methods in an effort gather data.

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A majority of the studies in the critical mass were conducted in the European countries of Greece and Spain, with individual studies taking place in Finland, Turkey and New Zealand. Four studies took place in Greece; the first study included 106 seventh grade students from central Greece. This study focused on the reciprocal and self-check teaching styles specific to the game of basketball. The second study contained 16 Greek PE teachers and focused on the teachers' beliefs and knowledge of reproduction and production teaching styles. The third study contained 288 Greek Physical Education Student Teachers. This study focused on the student teachers experiences, beliefs about, and intention to use the different teaching styles. The final study consisted of 219 Greek PE and focused on the teachers' self-perceptions about the use and benefits of each teaching style.

Three of the studies location took place in Spain. The study that took place in Andalusia contained 159 participants and focused on the effects of the command and mixed styles on student learning. The other two studies took place in Madrid. Both of the studies contained 455 subjects. One study focused on teachers' perception and use of different teaching styles while the other focused on teachers' knowledge and understanding of the spectrum of teaching styles. Another study took place in Finland. This study included 294 Finnish Physical Education teachers and their perceptions and knowledge of the spectrum of teaching styles. Another European-based study took place in Turkey and included 120 middle school Physical Education teachers. This study examined the self-reported use and the teachers' perceptions of the teaching styles while also being observed. The final study took place in New Zealand and included nine volunteer Physical Education Teachers and 32 students. This study focused on the benefits of models-based practice over traditional (direct) styles of teaching. All of the studies utilized

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contained information about teaching styles in Physical Education that contributed to the critical mass of this synthesis.

Chapter 3

Review of Literature

The purpose of this chapter is to review the literature associated with the use of teaching styles in physical education. There are a total of ten articles that make up the critical mass. Of the ten articles, five articles focused on Physical Education (PE) teachers working in the field, three articles focused on preservice Physical Education student teachers, and two articles focused on the students in a Physical Education class.

Physical Education Teachers in the Field

Fernandez-rivas and Espada's (2020) study sought to examine what teaching styles are most commonly used and preferred by Physical Education teachers. The subjects included 455 PE teachers from Madrid, Spain. Two-hundred eighty (61.5%) of the 455 teachers belonged to the primary stage (i.e. elementary schools) of teaching while 175 (38.5%) belonged to the secondary stage (i.e. middle/high schools). Additionally, participants included teachers who were graduates in the areas of physical activity and sport sciences (21.1%), graduates in physical education (47.4%), and teachers with both degrees (31.2%). This was a cross-sectional study, as it took place during the 2014-2015 school year.

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This study utilized a questionnaire and interviews as methods of data collection, making it a mixed methods study. The questionnaire consisted of questions regarding the importance and knowledge of teaching styles, sensations and difficulties related to their use, the frequencies of use, and level of acceptance. Interviews conducted during school hours were led by a single interviewer when the questionnaire was completed, with data collected and recorded. The quantitative data was analyzed using an inferential analysis through different tests (Student's t, ANOVA, and Welch), which all utilized the statistical programme SPSS, Version 20.

The results of this study are based on the personal perceptions of the subjects in regard to their answers on the questionnaire. Results showed that there was a variety in preferences of teaching and learning styles based on degree earned by the subjects and the teaching level. Graduates in physical activity and sports sciences considered the command and guided discovery styles to have the most influence on a student's physical and cognitive development. Additionally, the command style (focusing on psychomotor development) was most commonly used by physical education graduates and teachers with physical activity and sports sciences degrees. Graduates in Physical Education found the reciprocal teaching and guided discovery styles most difficult to use. This could be due to a lack of experience or knowledge about teaching styles. The subjects also had differing views about which styles are most accepted by students. Physical education graduates believe the command style is most accepted by students, while physical activity and sports sciences graduates consider guided discovery to be most accepted by students.

Teaching level also impacted the teaching and learning styles utilized by Physical Education teachers. Secondary PE teachers considered the command and guided discovery styles to have the most influence on a student's physical and cognitive development. The command

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style, however, was most commonly used by primary PE teachers rather than secondary PE teachers. Primary school teachers found the reciprocal teaching and guided discovery styles most difficult to use due to their lack of experience and knowledge in teaching styles. There were also differing views about styles which are most accepted by students. Primary school teachers believe the command style is most accepted by students, while secondary teachers consider guided discovery to be most accepted by students.

A second study developed by Fernandez-rivas and Espada-Mateos (2019) sought to analyze the knowledge and use of teaching styles by Physical Education teacher and determine if PE teachers completed courses to increase their knowledge of teaching styles. Subjects in this study were the same as those who were involved in Fernandez-rivas and Espada's (2020) study. Several variables about the subjects of interest in this study included age range, level of school (primary or secondary education), type of school (state, semi-private or private schools), and teaching experience. Subjects less than 30 years of age made up 18.2% of the sample, 55.4% of the subjects were between 31 and 40 years of age, 17.9% of the subjects were between 41 and 50 years of age, and 8.6% of the subjects were older than 51 years of age. Of the 455 teachers, 280 (61.5%) worked in primary education and 175 (38.5%) worked in secondary education. There was a distribution of 51.4% of teachers working in state schools, 38.7% of teachers working in semi-private schools, and 9.9% of teachers working in private schools. The teaching experience included ranges of one to five years (40% of population), six to 10 years (30.3% of the population), 11 to 15 years (16% of the population) 16 to 20 years (6.8% of the population) and more than 21 years (6.8%).

Identical to the previous study, data collection methods included a standardized interview along with a questionnaire, making it a mixed methods study. The interviews were carried out by

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a single interviewer who collected and recorded the data. The statistical analysis of the data involved an inferential analysis through correlation coefficients. The Leven test was used initially. Next, ANOVA and Welch were utilized depending on if there was a significant difference or not. Based on those results, a Turkey post-hoc or the Games-Howell post-hoc test was used. All of these tests used the statistical program SPSS, Version 20.

The results of this study centered on teachers' knowledge and personal use of teaching styles in physical education. There were a variety of preferences based on teaching level and teaching experience/age. Relative to the teaching level, results show that PE teachers in private and semi-private schools – no matter what their age or experience level - attended courses (professional development) to increase knowledge about teaching styles and utilized problem-solving styles more than their counterparts who taught in state schools. The attendance in courses may result in the application of new teaching styles. Additionally, semi-private PE teachers utilize the command style the most in their lessons. Relative to teaching experience and age, PE teachers over the age of 31 utilized the command style the most while teachers less than 30 years old utilized the problem-solving style in physical education lessons. The command style is used less by teachers with one to five years' experience while the problem-solving style is used more by teachers with one to 20 years' experience.

The third study had a two-part purpose. Jaakkola and Watt (2011) sought to investigate teachers' perceptions of how different teaching styles make physical education fun for and motivate their students as well as contribute to their learning. Another purpose was to examine the impact of teachers' personal and professional characteristics and background experiences on their perceptions of Mosston and Ashworth's teaching styles. The subjects in this study included 294 Finnish Physical Education Teachers which included 185 females and 109 males. The

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academic background of the subjects varied greatly with 213 having a degree in sport pedagogy, 20 in education, 54 in other curricula areas, and seven still completing their degree in sport pedagogy. Six subjects worked in elementary schools, 136 in secondary schools, 70 in upper secondary schools, 29 in vocational schools, and 48 in other schools with physical education included in their programs. The subjects were contacted electronically by email through the Finnish physical education teachers' association which is comprised of 900 members.

The instrument utilized in this study was a Finnish version of Kulinna and Cothran's (2003) teaching styles questionnaire, making it a quantitative study. The questionnaire was emailed to the subjects to complete. The questionnaire included scenarios for each teaching style followed by a question related to the subjects' perceptions of the style. The subjects were informed of the purpose of the study and were ensured the answers they provided would be kept confidential. Subjects provided background information about themselves to provide more information for the study.

Construct validity of the scale was determined by confirmatory factor analysis using AMOS 17.0 software. Additionally, separate MANOVAs and follow-up post hoc tests were performed. These were used to examine differences in teachers' experiences and overall perceptions of the teaching styles.

Results from the study indicated that, Finnish teachers used the command and practice styles the most while using the self-teaching, self-check and convergent discovery styles the least. This could be due to the teachers' perceptions that the practice and divergent production styles are the most beneficial for students while the reciprocal and convergent discovery styles are the least beneficial. Additionally, teachers with the least amount of teaching experience perceived the self-check, inclusion, guided discovery, and self-teaching styles as the most

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beneficial for their students. Their personal experiences or knowledge from classes could be the reason for this. Overall, the years of teaching experience influenced the styles Finnish teachers used in their Physical Education classes.

Parsak and Sarac's (2020) study sought to examine teachers' self-reported use and perception of teaching styles to determine what styles are used when teaching, and examine whether gender and teaching experience impact the teaching style being used. The subjects in this study included 120 middle school Physical Education teachers (58 women and 62 men) from Turkey. The participants were from 86 different schools with a distribution of 20.83% fifth grade teachers, 40% sixth grade teachers, 33.33% seventh grade teachers and 5.83% eighth grade teachers.

A survey questionnaire and direct observation tool were used to collect the data in this study, making it a quantitative study. The Turkish version of the Physical Education Teachers' Use of Teaching Styles and Perceptions of Styles Questionnaire was used to determine teachers' self-reported use and perceptions of teaching styles. The questionnaire consisted of 11 scenarios followed by four statements in which the subjects would choose the statement they most agree with.

A total of 120 PE lessons were taught by the 120 teachers and were observed, audio-recorded and video-recorded. The video and audio recordings were combined and synchronized using Adobe Premiere Pro CS6. The teachers' actual use of teaching styles from the videotaped PE lessons was identified using the Instrument for Identifying Teaching Styles (IFITS). IFITS is a systematic observation tool used for assessing the amount of time in which PE teachers employ the different teaching styles in their lessons. For coding, IFITS behaviors utilized a 10 second

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observation followed by a 10 second recording. Every 20 seconds, the teaching style was identified and coded until the end of the lesson.

To analyze the data, the videotaped lessons were segmented into 20 second intervals and analyzed using the IFITS instrument. Next, the percentage of intervals devoted to each teaching style was calculated for each class session. Teachers' self-reported use of teaching styles, perceptions of teaching styles, and total perception of teaching styles were calculated as well. This was assessed using the Kolmogorov-Smirnov test. Then, the statistical comparisons between groups based on gender and teaching experience utilized the Mann-Whitney U test and Kruskal-Wallis test at a 95% confidence level.

Results showed the command and practice styles were most employed and most valued by PE teachers. Learners' individual designed program, reciprocal, and learner-initiated styles were used relatively less than command and practice styles. Self-check, inclusion, guided discovery, convergent discovery, divergent discovery and self-teaching were never used by PE teachers. This shows the teachers' preference to utilize reproduction styles over production styles. Teachers also reported allocating a significant portion of their lessons to management-related activities. This also contributes to their reasoning for using more reproduction styles, i.e. to save time on management. Furthermore, it was found that the years of teaching experience and gender have no effect on teachers' use and perceptions of teaching styles or their use in the actual instructional setting.

The final study in this category was conducted by Syrmpas, Digelidis and Watt (2015). The purpose of this study was to explore Greek Physical Education teachers' self-perceptions about the use of different teaching styles and their benefits to students. The subjects of this study included 219 Greek PE teachers. Of these, 117 subjects, 53% worked in elementary schools and

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47% worked in middle or high schools. The majority of these subjects were recruited through professional development meetings in different areas of Greece and participated in the study voluntarily. The rest of the subjects were recruited through the educational union.

The instrument for this study included a Greek adaptation of Kulinna and Cothran's Spectrum teaching styles questionnaire, making it a quantitative study. There were brief descriptive scenarios for each teaching style included on the questionnaire that was followed by five statements, each of which were answered by using a 5-point Likert response scale.

Prior to the analysis, the data was examined for accuracy of data entry, missing values, fit distribution, and univariate and multivariate outliers. The mean and standard deviation scores were calculated to determine teachers' experiences with each teaching style, perceived ability to implement, and teachers' perceptions of students having fun, learning and being motivated for each teaching style. Next, the construct validity of the scale was analyzed by confirmatory factor analysis using AMOS version 20 software. The differences in PE teachers' experiences with various styles and overall perceptions were examined performing separate MANOVAs and post hoc tests. There was also a hierarchical regression analysis performed for each teaching style.

The results of this study are based on the answers to the questionnaire. Greek PE teachers reported greater use of guided discovery, divergent discovery and convergent discovery styles rather than reproduction styles (reciprocal and self-check). However, Greek PE teachers were found to use the command, inclusion and practice styles more often compared to self-teaching, learner-initiated and learner designed individual programme styles. Physical Education teachers reported having the ability to implement several Spectrum teaching styles but only indicated frequent use of the inclusion and convergent discovery styles.

Preservice Physical Education Student Teachers

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The first study in this category was conducted by Fyall and Metzler (2019) and sought to examine the benefits of models-based practice over the traditional styles of teaching. This study included nine graduate students from a PETE program in New Zealand. The average age of the participants was 22.9 years and included four males and five females.

The instrument utilized for data collection in this study was an interview based upon the perspectives, beliefs and experiences of participants in relation to models-based practice, making it a qualitative study. The interview followed a sequence that included an introduction, a statement of confidentiality, and asking permission to videotape the interviews. After the interview, the data was transcribed and participants completed a member-check. The data was collected and included in the analysis and reporting. Data analysis occurred through grouping, comparing and inductive analysis to find reoccurring themes among the answers of the participants.

The results of this study were based on the responses of the participants. It was confirmed that teachers felt that a variety of teaching styles were needed to meet the needs of all students. However, they stated a lack of experience when it comes to utilizing production teaching styles. It was also determined that reproduction styles are best in terms of developing new skills, while production styles are most beneficial for developing independent thinking, self-esteem and self-confidence.

The second study in this category addressed Physical Education teacher's thoughts and usage of Spectrum teaching styles. Sympas, Chen and Pasco (2018) sought to examine Greek preservice Physical Education teachers' presuppositions, beliefs and mental models about the reproduction and production teaching styles. The participants consisted of 16 preservice Greek PE teachers who were randomly selected from a pool of 90 second-year students of a four-year

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PE teacher education program. Second-year teachers were chosen because they had not yet been formally exposed to the reproduction and production teaching styles in their university coursework.

The instrument of measurement for this study was an interview guide designed to explore PE teachers' experiences with and beliefs about teaching styles. The interviewer was a trained PhD student. Each preservice PE teacher was interviewed individually with sessions lasting 25-30 minutes each. The interviews were audio-recorded and transcribed by the researcher for data analysis.

NVivo8 is the tool that was utilized for data analysis. Content analysis was used to analyze all of the documents as well. Additionally, qualitative analysis procedures were utilized to identify patterns of themes based on participants' answers. Finally, an axial coding process was conducted to identify features that define mental models held by preservice PE teachers.

Results of this study reflected the perceptions of the participants in relation to teaching styles in Physical Education. It was determined that preservice PE teachers developed their own understanding of teaching styles based on past experiences and sporting background. It was the style of teaching with which they were most familiar. Some participants perceived that learning is unidimensional, with the only emphasis on skill development, and thus reproduction styles would be best to achieve this goal. On the other hand, some participants perceived learning as multidimensional where the emphasis is on cognitive growth as well as skill development, and look to implement production styles to achieve goals. Several teachers concluded that motor skill development is one goal of PE, but it is not the only one. It was also found that teachers believed production styles helpful to promote students' personal and social responsibility and could also be used to influence class control.

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Syrmpas and Digelidis (2014) wrote the third article in this category. In this article, they sought to examine physical education student teachers' experiences with, beliefs about, and intention to use Spectrum teaching styles in their future occupations. The subjects in this study consisted of 288 Greek Physical Education teachers (158 males and 130 females). Their ages were 20-22 years old. 74 of the student teachers attended first and second years while 70 of them were third and fourth year students. Participation in the study was voluntary.

The instrument used for data collection was a modified version of Cothran, Kulinna and Ward's (2000) questionnaire, making it a quantitative study. Before the questionnaire was administered, specific instructions (both oral and written) were provided to the subjects. The questionnaire included scenarios for each of the Spectrum teaching styles and was followed by questions. In addition, there were two extra questions that were answered using a five-point Likert scale on whether they would implement the style in the future or if they had a PE teacher that had taught with that style before. To ensure the questionnaire was valid, it was translated to Greek and back to English by PhD students. The PhD students evaluated the questionnaire as well.

There were several steps in the data analysis process of the study. First, construct validity and internal consistency were analyzed using a confirmatory factor analysis through Amos 16 software. Next, Non-normed Fit Index, the Comparative Fit Index, and the Root Mean Squared Error of Approximation were utilized to examine if the model fit well. After this, MANOVAs were used to investigate differences in PE teachers' experience with each teaching style and their intention to implement those styles. Then, a Pearson product-moment correlation coefficient was computed to assess the relationship between PE student teachers' experiences on teaching styles and their intention to implement them in the future. Lastly, Pearson correlation analysis was

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performed to examine the relationship between PE student teachers' intention to adopt each teaching style and their perceptions on the style.

The results of this study are based on the answers to the questionnaire in regards to the student teachers' perceptions and beliefs about the Spectrum teaching styles. The results showed that a variety of teaching styles have been used in Physical Education in Greece. Greek PE teachers tend to use reproduction styles and rarely implement productive teaching styles, with the exception of guided discovery. More specifically, Greek PE student teachers report using the command and practice styles frequently compared to the learners' initiated program and self-check styles which were rarely used. This is because the Greek PE student teachers perceive reproduction styles to be more beneficial than production styles, so they tend to implement them more often.

Students in a Physical Education Class

The first article in this category was written by Cuellar-Moreno (2016), and addresses the effects of the command and mixed teaching styles on student learning in primary education. This study had three purposes. The first purpose was to compare the level of motor and conceptual results and to analyze the effectiveness of the command teaching style compared to a mixed-method. The second purpose was to investigate the association between students' thought processes and beliefs. The third purpose was to investigate the appropriate behavior of students in classes to identify whether greater learning is achieved and whether students have a more satisfactory and involved perception of classes depending on methodology used. The sample size included 159 students (77 male and 82 female) from a Physical Education program in Andalusia, Spain. The students were divided into eight classes where 80 students in four of the classes were

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taught using the command style and 79 students in four classes were taught using a mixed style consisting of guided discovery and reciprocal teaching.

Motor and cognitive content was measured prior to the experiment and after the experiment was completed. The data was collected using a rhythm test, a technical test and a conceptual test. These tests were used to measure the variables in the study. The variables included attention, satisfaction, appropriate behavior, and inappropriate behavior. The teaching style implementation was verified through systematic observation using style analysis checklists.

An inferential analysis of the results from the tests and questionnaires used was utilized to compare the percentages of improvement from the different styles used. The test used for this purpose was the Kruskal-Wallis Test due to specific variables being significant and others not. All of the analyses were performed using the Statistical Package for Social Sciences (SPSS).

The results of this study are based on the students' performance in a Physical Education lesson with either command style or a mixed-method approach. The results showed that a combination of the reciprocal teaching and guided discovery styles contributed to positive PE teaching, an increase in student attention, satisfaction, and appropriate behavior, and they enabled proper motor skill development. In addition, it was found that the command and task assignment styles targeted the psychomotor aspect of learning, while the reciprocal and guided discovery styles best promoted student involvement and student attentiveness (the cognitive and affective domains).

The second study of this category focused on the implementation of the reciprocal and self-check teaching styles in Physical Education. Digelidis, Byra, Mizios, Syrmpas and Papaioannou (2018) sought to investigate the impact of the application of the reciprocal and self-check teaching styles on students' intrinsic-extrinsic motivation, lesson satisfaction, autonomy

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and motor skill performance specific to the game of basketball. The subjects included 106 seventh grade students from Central Greece. The students were divided into three groups, the control group, the reciprocal teaching group and the self-check teaching group.

Data was measured at two different points throughout the study, at the beginning and at the end. There were several tests administered throughout this process. These tests included Harrison's "Basketball skill" test for dribbling that was developed in 1996, Stubbs "Ball Handling" test for chest-pass that was developed in 1968, a basketball shooting test that was developed in 1991 by Weinberg, Fowler, Jackson, Bangall and Bruya, an enjoyment scale that was developed in 2007 by Papaioannou, Milosis, Kosmidou and Tsigilis, and a situational motivation scale developed in 2000 by Guay, Vallerand and Blanchard to measure intrinsic motivation. The questionnaires were completed in the classroom while the physical tests were administered in the gymnasium.

Data analysis consisted of two steps. First, a correlation analysis was utilized among the four factors of the questionnaire of the intrinsic-motivation in a situational level. Next, co-variation analyses were used to investigate the intervention effects. These examined whether there were statistical significant differences in variables.

The results of this study were based on the students' scores from the multiple tests. It was confirmed that the reciprocal and self-check teaching styles had a positive impact on learning, maintaining motor skills, and stimulating self-regulation of the students. From a more physical perspective, students' performance in passing, dribbling, and shooting skills improved significantly with the contribution of the reciprocal and self-teaching styles. The self-check teaching style, however, produced better scores for students in terms of enjoyment, intrinsic motivation and self-regulation than the reciprocal teaching style.

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The review of literature for this synthesis included a focus on Physical Education teachers in the field, preservice PE teachers, and students in a Physical Education class. The review of literature shows that a variety of teaching styles are employed all over the world, but most teachers prefer the use of reproduction styles. Individuals in these studies may have personal preferences as to what works best for them in their own classes. However, there is an increase in the utilization of production teaching styles in Physical Education. Several studies share the belief that the application of several teaching styles helps to meet the needs of all students.

Chapter 4

Results

The purpose of this chapter is to present the results of this synthesis, whose purpose was to investigate the impact of teaching styles in Physical Education. There were a total of 10 studies which made up the critical mass and formed the basis for the results of this synthesis. The following research questions were answered as a result of this synthesis; the literature related to each question is presented below:

Research Questions:

1. What are teachers' perceptions relative to the different teaching styles used in Physical Education?
 - a. Do PE teachers prefer one set of styles (or one specific style) over another?
 - b. What factors that might influence these preferences?
2. What are Physical Education teachers' beliefs about reproduction and production teaching styles and their relationship to the content being taught?
3. Do intended curricular goals across the three domains of learning influence teachers' choices of particular teaching styles for instruction?

What are teachers' perceptions relative to the different teaching styles used in Physical Education?

A total of seven studies included in this synthesis focused on teachers' perceptions of different teaching styles used in Physical Education. Physical Education teachers' perceptions are based on personal preference and factors that influence their preferences. These factors play a significant role in the choice of teaching style utilized by PE teachers.

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Based on the teachers' responses to questionnaires, a common theme emerged relative to the teaching styles which Physical Education teachers preferred. Articles written by Fernandezrivas and Espada (2020), Jaakkola and Watt (2011), Parsak and Sarac (2020), Sympas and Digelidis (2014) and Sympas, Digelidis and Watt (2015) revealed that Physical Education teachers prefer the use of reproduction styles (i.e. those which call for the replication of knowledge and skills) over production styles (i.e. those which challenge students to discover new knowledge while making a majority of the instructional decisions). More specifically, Physical Education teachers prefer the use of the command and practice styles when teaching new skills and reducing management time in lessons (Sympas & Digelidis, 2014). Teachers tend to use reproduction styles because they are afraid to lose control of the students. They also believe the use of direct teaching styles is the most effective in regard to time management and is the most appropriate method to deliver the knowledge they desire the students to learn (Jaakkola & Watt, 2011).

A number of factors influence the preferences of Physical Education teachers in regard to teaching styles. These factors include age/teaching experience and past experiences. Fernandezrivas and Espada-Mateos (2019) discovered that the age of Physical Education teachers and their years of teaching experience impact the preference of teaching style. More specifically, teachers with more than five years' experience (i.e. those over the age of 31), tend to use reproduction styles such as the command style while teachers with less experience, (31 years of age or less), most prefer the utilization of production styles such as the problem-solving style. Novice teachers with less experience tend to utilize production styles more often due to their experiences in college and knowledge of teaching styles while veteran teachers stick to traditional styles because they have a lack of knowledge about production teaching styles (Fernandez-rivas &

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Espada-Mateos, 2019). Similarly, Jaakkola and Watt (2011), state that more experienced teachers utilize reproduction styles more often than production styles because they learned reproduction styles help to achieve lesson objectives better throughout their careers.

Syrmpas, Chen and Pasco (2018) found that teachers' past experiences also influence the preference of teaching style. They found that preservice PE teachers (i.e. those still in colleges) developed their own understanding and preferences of teaching styles based on their own past experiences and sporting background. For example, if an individual had a PE teacher who utilized the command style, they were more likely to implement that style because it is more familiar to them.

The results from the above studies show that Physical Education teachers prefer the use of reproduction styles over production styles. Factors which influence these preferences are the age of the teacher and the amount of teaching experience. It was found that older teachers with more experience tend to use reproduction styles more often due to an emphasis on motor skill development and class control, while younger teachers with less experience tend to utilize production styles due to their personal experiences from their own K-12 schooling and their knowledge base from their pre-service education.

What are Physical Education teachers' beliefs about reproduction and production teaching styles and their relationship to the content being taught?

A total of four studies focused primarily on teachers' beliefs about teaching styles and their influence on content. Physical Education teachers' beliefs about teaching styles are important because they can impact the way lesson content is taught to students. Results showed that teachers believed certain content pairs better with reproduction styles, while other content pairs better with production styles.

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Fyall and Metzler (2019) found that the content being taught by a Physical Education teacher may be impacted more by specific teaching styles. Physical education teachers believe reproduction styles are best when it comes to developing movement and sport-specific skills because students are replicating the movement and skills exactly as demonstrated by the teacher. Similarly, Sympas, Chen and Pasco (2019) found that those preservice Physical Education teachers in the study who believed that learning in PE is unidimensional (meaning students are only learning skill development) tend to believe that skill development is best achieved through reproduction styles compared to production styles. This finding was also supported by Digelidis, Byra, Mizios, Sympas and Papaioannou in their 2018 study, where they found that the reciprocal and self-check teaching styles (i.e. reproduction styles) had more of an impact than production styles on the building and maintenance of dribbling, passing, and shooting skills related to the game of basketball. Cuellar-Moreno (2016) also found that reproduction styles – more specifically, the command and task assignment teaching styles - target the development of motor skills better than production teaching styles.

In contrast to unidimensional learning, Sympas, Chen and Pasco (2019) found that those preservice Physical Education teachers who perceived learning to be multidimensional (meaning students can learn more than just motor skill development in a PE lesson) believed that production styles could be used to influence knowledge about skills and cooperation in students. This is supported by Fyall and Mezler in their 2019 study, where they found that production styles can be utilized in activities such as problem-solving activities in order to develop independent thinking, self-esteem, and self-confidence. In addition, Physical Education teachers believed that production styles can be used to promote students' personal and social

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responsibility through different cooperative activities instead of reproduction styles (Syrmpas, Chen & Pasco, 2019).

The results from the above studies show that the beliefs of Physical Education teachers about differing teaching styles influences the content taught in lessons. It was found that teachers believe reproduction styles to be more beneficial when teaching activities that involve motor skill development, while production styles are more efficient when teaching problem-solving and cooperative activities. A combination of reproduction and production styles should be used to teach Physical Education content.

Do intended curricular goals across the three domains of learning influence teachers' choices of particular teaching styles for instruction?

A total of six studies focused on how teaching styles in Physical Education impact student learning in the three domains. There has been a growing emphasis on teaching students to learn in all three domains in Physical Education (Parsak & Sarac, 2000). Results showed that different teaching styles can be used to target the psychomotor, cognitive and affective domains, specifically.

In the psychomotor domain, Digelidis, Byra, Mizios, Syrmpas and Papaioannou (2018), Jaakkola and Watt (2011), Cueller-Moreno (2016), Fyall and Metzler (2019), Parsak and Sarac (2020), Syrmpas, and Chen and Pasco (2018) found that reproduction styles make a significant impact on student learning. More specifically, Cueller-Moreno (2016) and Jaakkola and Watt (2011) found the command and practice styles to work best for the development of motor skills in students (Cueller-Moreno, 2016). An example is provided by Digelidis et al. (2018) in their study where the reciprocal teaching style was utilized to develop sport-specific skills related to

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the game of basketball. These studies show that reproduction styles are best used to target the psychomotor domain of learning.

In the cognitive and affective domains, Syrmpas, Chen and Pasco (2019), Cuellar-Moreno (2016), and Fyall and Metzler (2019) found that production styles best influence student learning in these domains. Fyall and Metzler (2019) found that production styles can be used to develop independent and critical thinking in problem-solving activities, which impact the cognitive domain. In the affective domain, production styles can be used to promote students' personal and social responsibility to assist in class control (Syrmpas, Chen & Pasco, 2018). Additionally, Cuellar-Moreno (2016) found that the guided discovery style promoted student involvement and attentiveness in classroom activities. These studies show how production styles can be used to target the cognitive and affective domains of learning.

The choice of teaching style is important, as it encourages the acquisition of learning in all three domains (Cuellar-Moreno, 2016). These studies show how utilizing reproduction and production teaching styles can be used to target learning in the psychomotor, cognitive and affective domains. A combination of reproduction and production styles is needed to promote learning in all three domains, simultaneously.

Chapter 5

Conclusion/Future Research

This section of the synthesis provides a conclusion of the research and gives suggestions for future research. The conclusion consists of three main points that should be taken away from the synthesis project. Future research provides direction for future studies to learn more about teaching styles in Physical Education.

Conclusion

A total of 15 articles were examined to investigate the impact of teaching styles on student learning in Physical Education (PE), with ten of these articles being included in the critical mass. The research contained information about teachers' perceptions relative to the different teaching styles in Physical Education, Physical Education teachers' beliefs about the different teaching styles and their relationship to the content being taught, and how intended curricular goals across the three domains of learning influence teachers' choices of particular teaching styles for instruction. Based upon the findings in these articles, three key ideas to this synthesis have emerged. The key ideas include how Physical Education teachers prefer the utilization of reproduction styles over production styles, how their beliefs impact which teaching styles they implement, and how teachers need to increase the usage of production teaching styles as a means to develop not only psychomotor goals in the PE curriculum.

Fernandezrivas and Espada (2020), Jaakkola and Watt (2011), Parsak and Sarac (2020), Syrmpas and Digelidis (2014), Fernandez-rivas and Espada-Mateos (2019), Syrmpas, Chen and Pasco (2018), and Syrmpas, Digelidis and Watt (2015) explored teachers' perceptions relative to the different teaching styles in Physical Education and found that PE teachers prefer the utilization of reproduction styles over production styles. Physical Education teachers found that

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the use of direct teaching styles (i.e. reproduction styles) are the most effective in regards to time management and is the most appropriate method for delivering knowledge they desire the students to learn (Jaakkola & Watt, 2011). The use of reproduction styles by PE teachers may also be due to a lack of knowledge and understanding of production styles and how they are implemented (Parsak & Sarac, 2020).

Physical Education teachers' beliefs about reproduction and production teaching styles will impact which styles they actually implement. Syrmpas, Chen and Pasco (2019), Digelidis, Byra, Mizios, Syrmpas and Papaioannou (2018), and Cuellar-Moreno (2016) found that Physical Education teachers believe reproduction styles are best for activities that involve the development of movement and sport-specific skills. This is because these styles require students to replicate the movements and skills exactly as demonstrated by the teacher. Physical Education teachers also believe that production styles can be utilized to influence knowledge and cooperation in students through activities such as problem-solving and cooperative activities (Fyall & Metzler, 2018; Syrmpas, Chen & Pasco, 2019).

The final focus of the synthesis includes the increase in usage of production teaching styles to develop not only psychomotor goals in the PE curriculum, but cognitive and affective goals as well. Digelidis, Byra, Mizios, Syrmpas and Papaioannou (2018), Jaakkola and Watt (2011), Cuellar-Moreno (2016), Fyall and Metzler (2019), Parsak and Sarac (2020), Syrmpas, and Chen and Pasco (2018) discovered that the utilization of production styles can be used to influence student learning in the cognitive and affective domains of learning. Production teaching styles have been found to promote student involvement, student attentiveness, independent thinking, self-esteem, and self-confidence (Cuellar-Moreno, 2016; Fyall & Metzler, 2019). Physical Education teachers that aim to create a learning context that promotes physical

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activity as a lifelong habit should utilize production styles to promote enjoyment and psychological well-being which physical activities offer (Digelidis, Byra, Mizios, Syrmpas & Papaioannou, 2018).

There are three main take-aways from this synthesis. Physical Education teachers prefer the use of reproduction styles over production styles, PE teachers' beliefs can influence the teaching styles they implement, and PE teachers need to increase the usage of production teaching styles to develop cognitive and affective goals in the PE curriculum. By examining these three key points, ideas for future research can be determined.

Future Research

To continue learning about teaching styles in Physical Education, there must be a continuation of research centering on this topic. One suggestion for future research is to investigate reasons why teachers prefer more teacher-centered styles of teaching in Physical Education. There was a common theme throughout several studies that show Physical Education teachers prefer the use of reproduction styles over production styles. Additional studies can aim to determine why this is, and shift towards a more mixed-method approach for teachers. Utilizing a mixed-method approach will ensure student learning in all three domains (Jaakkola & Watt, 2011).

A second suggestion for future research is directed at determining teaching styles and their role in Physical Education in regards to educational value and measures in students (Cuellar-Moreno, 2016). Future studies can determine which teaching styles motivate students to learn specific content and best help students to retain knowledge and movements related to Physical Education. Certain teaching styles may help students to learn specific content. Future studies should focus on specific teaching styles and the content they pair best with.

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Future research is crucial in finding what teaching styles are most effective for student learning in Physical Education. Future research can provide guidance and insight on the utilization of teaching styles in Physical Education and can help to influence student learning in all three domains of learning.

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Author/Title/Citation	Purpose	Methods & Procedures	Analysis	Findings	Discussion/Recommendations Research Notes – Commonalities/Differences
<p>Cuellar-Moreno, M. (2016). Effects of the command and mixed styles on student learning in primary education. <i>Journal of Physical Education & Sport</i>, 16(4), 1159-1168.</p>	<p>This study has 3 purposes.</p> <ul style="list-style-type: none"> *Compare the level of motor and conceptual results, analyzing the effectiveness of the command teaching style compared to a mixed-method. *Investigate the association between students' thought processes and beliefs. *Investigate the appropriate behavior of students in classes to identify whether greater learning is achieved and whether students have a more satisfactory and involved perception of classes depending on methodology used. 	<ul style="list-style-type: none"> *Sample size of 159 students from Andalusia, Spain *A Rhythm test, a technical test, and a conceptual test were used to measure the variables in the study *Variables included attention, satisfaction and appropriate and inappropriate behavior *Teaching style implementation was verified through systematic observation using style analysis checklists 	<ul style="list-style-type: none"> *Test used for analysis was the Kruskal-Wallis Test *Analyses were performed using the SPSS (Statistical Package for Social Sciences) *Mixed Methods study 	<ul style="list-style-type: none"> *A combination of reciprocal teaching and guided discovery contributes to positive PE teaching, increasing student attention, satisfaction, appropriate behavior and enables proper motor skill development. *Reciprocal and guided discovery styles promote student involvement and student attentiveness (cognitive and affective domains) *Command and task assignment target psychomotor aspect of learning. 	<ul style="list-style-type: none"> *Needs further research to determine teaching styles and their role in PE in regards to educational value and retention measures in students. *Recommend expanding the sample of students and teaching content. *Choice of TS is important as it encourages the acquisition of learning in all three domains.

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Author/Title/Citation	Purpose	Methods & Procedures	Analysis	Findings	Discussion/Recommendations Research Notes – Commonalities/Differences
<p>Digelidis, N., Byra, M., Mizios, D., Syrmpas, S. I., & Papaioannou, A. (2018). The reciprocal and self-check teaching styles in physical education: Effects in basketball skills' performance, enjoyment, and behavioral regulations. <i>International Journal of Physical Education</i>, 55(4), 13-23.</p>	<p>The purpose of this study is to investigate the impact of the application of the reciprocal and self-check teaching styles on students' intrinsic-extrinsic motivation, lesson satisfaction, and autonomy, and student motor skill performance specific to the game of basketball.</p>	<p>*106 seventh grade students from Central Greece</p> <p>*Harrison's "Basketball skill" (1996) test for dribbling</p> <p>*Stubbs Ball Handling Test for chest-pass (1968)</p> <p>*Basketball shooting test developed by Weinberg, Fowler, Jackson, Bangall, and Bruya (1991)</p> <p>*Enjoyment scale developed by Papaioannou, Milosis, Kosmidou, and Tsigilis (2007) to measure enjoyment</p> <p>*Situational Motivation Scale developed by Guay,</p>	<p>*Correlation analysis among the four factors of the questionnaire of the intrinsic-motivation in a situational level.</p> <p>*Co-variation analyses to investigate the intervention effects.</p> <p>*Quantitative Study</p>	<p>*The reciprocal and self-checking teaching styles had a positive impact on learning and maintaining motor skills and stimulating self-regulation of the students.</p> <p>*Students' performance in passing skills, dribbling, and shooting improved significantly with the contribution of the reciprocal teaching and self-check teaching styles.</p> <p>*The self-check method produced better scores in terms of enjoyment, intrinsic motivation and identified regulation than the</p>	<p>*Reciprocal teaching and self-check methods help students to improve their skills.</p> <p>*Self-check teaching style encourages students to discover their abilities themselves, to set personal targets, to self-evaluate, and to take an active part in the decision-making procedure.</p> <p>*Adopting production teaching styles that enhance students' motivation is important in improving the performances in the motor section and in promoting a healthy psychological environment.</p> <p>*PE teachers aimed at creating a learning context that promotes physical activity as a lifelong habit should: use productive or indirect teaching methods and promote enjoyment and psychological well-being</p>

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Author/Title/Citation	Purpose	Methods & Procedures	Analysis	Findings	Discussion/Recommendations Research Notes – Commonalities/Differences
		Vallerand and Blanchard (2000) to measure intrinsic motivation		reciprocal teaching style.	which physical activities offer.

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Author/Title/Citation	Purpose	Methods & Procedures	Analysis	Findings	Discussion/Recommendations Research Notes – Commonalities/Differences
<p>Fernandez-rivas, M., & Espada, M. (2020). Physical education teachers' use of and feeling for teaching styles. <i>Journal of Physical Education & Sport</i>, 20(1), 3-13.</p>	<p>The purpose of this study is to see what teaching styles are most commonly used and preferred by teachers.</p>	<p>*Sample size of 455 teachers from Madrid, Spain</p> <p>*61.5% of teachers belonged to primary stage of teaching, 38.5% belonged to secondary stage of teaching</p> <p>*21.1% were graduates in Physical Activity and sports sciences, 47.4% were PE graduates, 31.2% were teachers with both degrees</p> <p>*Quantitative, descriptive and non-experimental methodology</p> <p>*Questionnaire for the analysis of teaching styles used</p>	<p>*Involved an inferential analysis through different tests (Student's t, ANOVA and Welch) all used the statistical programme SPSS, Version 20.</p>	<p>*Great variety in preferences of teaching and learning styles based on teaching experience</p> <p>*Grads in PA, SS, teachers with both degrees, secondary PE teachers consider command and guided discovery styles to have most influence (phys. and cog. development)</p> <p>*Command (phys. development) more commonly used by PE grads, teachers with both degrees, and primary teachers.</p> <p>*Graduates in PE and primary education – reciprocal teaching</p>	<p>*Lack of education about teaching styles leads to uncertainty in some teachers</p> <p>*Wide variety of perceptions of teachers which styles should be used to influence different domains.</p> <p>*More research is needed to see what styles should be employed to influence learning in all three domains.</p> <p>*Teachers need more experience and time spent with teaching styles to implement effectively.</p> <p>*Teachers tend to implement styles that most influenced them growing up.</p>

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Author/Title/Citation	Purpose	Methods & Procedures	Analysis	Findings	Discussion/Recommendations Research Notes – Commonalities/Differences
		in Physical Education		<p>and guided discovery most difficult to use</p> <p>*PE grads and primary teachers believe command style most accepted by students</p> <p>*PA, SS grads, teachers with both degrees, secondary teachers consider guided discovery most accepted by students</p>	

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Author/Title/Citation	Purpose	Methods & Procedures	Analysis	Findings	Discussion/Recommendations Research Notes – Commonalities/Differences
<p>Fernandez-rivas, M., & Espada-Mateos, M. (2019). The knowledge, continuing education and use of teaching styles in physical education teachers. <i>Journal of Human Sport & Exercise, 14</i>(1), 99-111.</p>	<p>The purpose of this study is to analyze the knowledge and use of teaching styles by the PE teacher and determine if PE teachers follow courses on teaching styles.</p>	<p>*Sample size of 455 PE teachers from Madrid, Spain</p> <p>*A quantitative, descriptive and non-experimental methodology was used.</p> <p>*Instrument of measurement was a standardized interview using a questionnaire.</p>	<p>*Levene test was used first.</p> <p>*ANOVA and Welch was second depending on if there was a significant difference.</p> <p>*Based on those results, a Turkey post-hoc test or the Games-Howell post-hoc test was used.</p> <p>*All using the statistical program SPSS, Version 20.</p>	<p>*PE teachers in private and semi-private schools attended courses about teaching styles and use problem solving more.</p> <p>*Semi-private school teachers utilize command style the most.</p> <p>*Command style is used less by teachers with 1-5 years' experience while problem-solving style used more by teachers with 1-20 years' experience</p> <p>*Command style used more by teachers over 31, problem-solving style used less by teachers under 30.</p>	<p>*Research showed teachers have knowledge of teaching styles but have personal preferences.</p> <p>*To know which teaching style is best to use, teachers need to pay attention to individual differences and look for an active methodology to get students involved in their own learning.</p> <p>*Younger teachers tend to utilize more production styles due to their personal experiences and knowledge while older teachers tend to stick to the ways they've always taught.</p> <p>*Teaching styles influence students in different ways, favoring the channel development (social, cognitive, physical, and affective).</p>

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Author/Title/Citation	Purpose	Methods & Procedures	Analysis	Findings	Discussion/Recommendations Research Notes – Commonalities/Differences
<p>Fyall, F., & Metzler, M. W., (2019). Aligning critical physical education teacher education and models-based practice. <i>Physical Educator</i>, 76(1), 24-56.</p>	<p>The purpose of this study is to examine the benefits of models-based practice over the traditional styles of teaching.</p>	<p>*9 graduate students of a PETE program in New Zealand</p> <p>*Interview based on the perspectives, beliefs, and experiences of participants in relation to models-based practice</p>	<p>*Data analysis occurred through grouping, comparing, and inductive analysis to find reoccurring themes.</p> <p>*Qualitative Study</p>	<p>*A variety of teaching styles are needed to meet the needs of all students.</p> <p>*Teachers have a lack of experience when it comes to production styles in teaching.</p> <p>* Teacher-centered styles would be best to develop new skills.</p> <p>*Learner-centered styles would be best to develop independent thinking, self-esteem, or self-confidence.</p>	<p>* The teaching style being used depends on the characteristics of the students and the content being taught.</p> <p>*PE teachers need to align learning objectives with the appropriate teaching style.</p>

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Author/Title/Citation	Purpose	Methods & Procedures	Analysis	Findings	Discussion/Recommendations Research Notes – Commonalities/Differences
<p>Jaakkola, T., & Watt, A. (2011). Finnish physical education teachers' self-reported use and perceptions of Mosston and Ashworth's teaching styles. <i>Journal of Teaching in Physical Education</i>, 30(3), 248-262.</p>	<p>This study has two purposes.</p> <ul style="list-style-type: none"> *To investigate teachers' perceptions of how different styles make physical education fun, contribute to learning, and motivate their students. *To examine the impact of teachers' personal and professional characteristics and background experiences on their perceptions of Mosston and Ashworth's teaching styles. 	<ul style="list-style-type: none"> *294 Finnish physical education teachers. *Finnish version of Kulinna and Cothran's (2003) teaching styles questionnaire. 	<ul style="list-style-type: none"> *The construct validity of the scale was analyzed by Confirmatory Factor Analysis using AMOS 17.0 software. Separate MANOVAs and follow-up post hoc tests were performed to examine differences in teachers' experiences and overall perceptions of the teaching styles. *Quantitative Study 	<ul style="list-style-type: none"> *Finnish teachers use the command and practice styles the most and the self-teaching, self-check and convergent discovery styles the least. *Finnish teachers perceived practice and divergent production styles as most beneficial and the reciprocal and convergent discovery styles as least beneficial students. *Years of teaching experience influence styles used in PE. *Youngest group of teachers perceived the self-check, inclusion, guided 	<ul style="list-style-type: none"> *Teachers tend to favor more teacher-centered (reproduction) styles due to teachers' lack of knowledge or experience in the use of a variety of teaching styles. *Teachers use teacher-centered styles for 3 reasons: they're afraid to lose control of students, they feel direct teaching is the most effective method in regard to time management, and teachers have the knowledge necessary for student learning to occur and direct teaching is the appropriate method to deliver the knowledge. *Finnish teachers may utilize command and practice styles more because they emphasize motor skill learning rather than social or cognitive aspects of PE. *Future studies should investigate why teachers prefer teacher-centered to

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				discovery, and self-teaching styles as most beneficial for students.	student-centered styles of teaching in PE.

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<p>Parsak, B., & Sarac, L. (2020). Turkish physical education teachers' use of teaching styles: Self-reported versus observed. <i>Journal of Teaching in Physical Education</i>, 39(2), 137-146.</p>	<p>The purpose of this study is to examine self-reported use and perception of teaching styles, determine what styles are used when teaching, and examine whether gender and teaching experience are differentiating factors.</p>	<p>*Participants included 120 middle school PE teachers from Turkey</p> <p>*Ethical committee approval was obtained through Mersin University and MoNE</p> <p>*Data was collected using the Physical Education Teachers' Use of Teaching Styles and Perceptions of Styles Questionnaire and the Instrument for Identifying Teaching Styles.</p>	<p>*Videotaped lessons were segmented into 20 second intervals and analyzed using the IFITS instrument.</p> <p>*Teachers' self-reported use of teaching styles, perceptions of teaching styles, and total perception of teaching styles were calculated and assessed using the Kolmogorov-Smirnov test.</p> <p>*Statistical comparisons between groups based on gender and teaching experience utilized the Mann-Whitney U test and Kruskal-Wallis test at a 95% confidence level.</p> <p>*Quantitative Study</p>	<p>*Command and practice styles were most employed and valued, learner's individual designed program, reciprocal and learner-initiated styles relatively less, and never use self-check, inclusion, guided discovery, convergent discovery, divergent discovery or self-teaching.</p> <p>*Years of teaching experience have no effect on teachers' use and perceptions of teaching styles.</p> <p>*Teachers allocated a significant portion of their lessons to management-related activities.</p>	<p>*Teachers favored reproduction styles due to their belief in superior effectiveness for learning and developing motor skills.</p> <p>*Teachers reported using and valuing a wide variety of teaching styles, but tend to use reproduction styles most often as they are more familiar with them.</p> <p>*Lack of class time and proper facilities/equipment influence use of reproduction styles.</p> <p>*Use of reproduction styles may also be due to lack of knowledge, understanding or skills of production styles.</p> <p>*More research is needed to better understand how teachers use the various teaching styles and which styles they actually employ.</p> <p>*Further descriptive and experimental investigations</p>

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				<p>*Gender and teaching experience had no effect on the teachers' perceptions of teaching style or their use in the actual instructional setting.</p>	<p>are necessary to discover the reasons for the widespread usage of teacher-centered styles among PE teachers.</p> <p>*Both quantitative and qualitative research is recommended to find out why teacher-centered styles are preferred. Is it preference or is it due to insufficient or inadequate knowledge/training and equipment, or other reasons.</p>

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<p>Syrmpas, I., Chen, S., & Pasco, D. (2019) Greek preservice physical education teachers' mental models of production and reproduction teaching styles. <i>European Physical Education Review</i>, 25(2), 554.</p>	<p>The purpose of this study is to examine Greek preservice physical education teachers' presuppositions, beliefs and mental models about the reproduction and production teaching styles.</p>	<p>*Participants included 16 preservice Greek PE teachers</p> <p>*An interview guide was designed to explore PE teachers' experiences with and beliefs about teaching styles.</p>	<p>*NVivo8 was the data analysis tool.</p> <p>*Documents were analyzed using content analysis.</p> <p>*Qualitative analysis procedures were utilized to identify patterns of themes based on participants' answers.</p> <p>*An axial coding process was conducted to identify features that define mental models held by preservice PE teachers.</p> <p>*Quantitative Study</p>	<p>*Preservice PE teachers developed their own understanding of teaching styles based on past experiences and sporting background.</p> <p>*PE teachers perceive that learning is unidimensional and the emphasis is on skill development so reproduction styles lead to this goal.</p> <p>*PE teachers that perceive learning as multidimensional look to implement production styles.</p> <p>*Motor skill development is one</p>	<p>*PE teachers should be educated in teaching styles and know which styles lead to specific outcomes based on context and lesson objectives.</p> <p>*PE teachers can influence the development of the cognitive and affective domains through the utilization of production styles, but not just the guided discovery approach.</p> <p>*PE teachers should implement a variety of teaching styles aimed at accomplishing diverse goals in lessons.</p> <p>*PE teachers' presuppositions, beliefs, and mental models play a role in the teaching roles they implement.</p> <p>*Future studies should:</p> <ol style="list-style-type: none"> 1. Examine teachers' motivation and personal traits

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				<p>goal of PE, but not the only one.</p> <p>*Production styles promote students' personal and social responsibility and may also influence class control.</p>	<p>(self-efficacy, self-esteem, perceived control of learning process) as they influence learning.</p> <p>2. Examine curriculum effectiveness on students' knowledge development by exploring teachers' beliefs about teaching styles through the duration of their studies.</p> <p>3. Include a broader variety of methods for data collection and a greater number of participants.</p>

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<p>Syrmpas, I., & Digelidis, N. (2014). Physical education student teachers' experiences with and perceptions of teaching styles. <i>Journal of Physical Education & Sport</i>, 14(1), 52.</p>	<p>The purpose of this study is to examine physical education student teachers' experiences with, beliefs about, and intention to use Spectrum teaching styles in the future.</p>	<p>*Participants included 288 Physical Education Student Teachers in Greece</p> <p>*Modified version of Cothran, Kulinna and Ward's (2000) questionnaire.</p> <p>*Quantitative Study</p>	<p>*Construct validity and internal consistency were analyzed using a Confirmatory Factor Analysis through Amos 16 software.</p> <p>*Non-normed Fit Index, the Comparative Fit Index, and the Root Mean Squared Error of Approximation were the indices that were used in order to examine if the model fit well.</p> <p>*MANOVAs were used to investigate differences in PE teachers experiences with each teaching style and their intention to implement those styles.</p> <p>*A Pearson product-moment correlation coefficient was</p>	<p>*A variety of teaching styles have been used in PE in Greece.</p> <p>*Greek PE teachers tend to use reproduction teaching styles and rarely implement productive teaching styles.</p> <p>*PE student teachers reported that PE teachers use the command and practice styles frequently compared to the learners' initiated program and self-check styles which are rarely used.</p> <p>*Greek PE teachers utilize the guided discovery style.</p>	<p>*Greek PE teachers could use reproductive styles more due to the importance they place on course control where student learning is believed to be a lower priority.</p> <p>*Teachers use reproduction styles because they find it is easier to transfer knowledge and content to their students while maintaining class control.</p> <p>*PE teachers tend to be coaches and most coaching styles are command style.</p> <p>*PE student teachers have grounded beliefs of what PE is before going to college. It is difficult for colleges to shift their views toward student-centered learning since they were so used to teacher-centered styles.</p>

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			<p>computed to assess the relationship between PE student teachers' experiences on teaching styles and their intention to implement them in the future.</p> <p>*Pearson correlation analysis was performed to examine the relation between PE student teachers intention to adopt each teaching style and their perceptions on each style.</p>	<p>*Student teachers perceived reproduction styles as more beneficial than production styles.</p>	

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<p>Syrmpas, I., Digelidis, N., & Watt, A. (2015). An examination of greek physical educators' implementation and perceptions of spectrum teaching styles. <i>European Physical Education Review</i>, 22(2), 201-214.</p>	<p>The purpose of this study is to explore Greek PE teachers' self-perceptions about the use and benefits to students of Spectrum teaching styles.</p>	<p>*Participants included 219 Greek PE teachers. *Greek language adaptation of Kulinna and Cothran's (2003) Spectrum teaching styles questionnaire. *Quantitative Study</p>	<p>*Mean and standard deviation scores were calculated to describe teachers' experiences with each teaching style, perceived ability to implement, and teachers' perceptions of students having fun, learning, and being motivated for each teaching style. *Construct validity of the scale was analyzed by Confirmatory Factor Analysis using AMOS version 20 software. *Differences in PE teachers' experiences with various styles and overall perceptions were examined performing separate MANOVAs and post hoc tests.</p>	<p>*Greek PE teachers use of command, inclusion and practice styles more compared to self-teaching, learner-initiated, and learner designed individual programme styles. *Teachers reported greater use of guided discovery, divergent discovery and convergent discovery styles rather than reproduction styles (reciprocal and self-check). *Teachers reported higher perceived ability to implement Spectrum teaching styles but only indicated they used inclusion and convergent</p>	<p>*The results support the proposition that curriculum developers should redesign the content of undergraduate studies by including the implementation of production teaching styles. *During undergraduate studies, PE teachers should experience a wide variety of teaching methods to expand their knowledge and comfortability. *Early career and experienced PE teachers should incorporate Spectrum teaching styles theory and practical application into their curriculum.</p>

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			*Hierarchical regression analyses were performed for each teaching style.	discovery styles more frequently.	