

Exploring the Process of Conceptual Change of Pre-Service Teachers in a Physical Education Teacher Preparation Program

**By Glenn Hushman, Gloria Napper-Owen,
& Carolyn Hushman**

*Glenn Hushman and
Gloria Napper-Owen
are assistant professors
in the Department of
Health, Exercise, and
Sports Sciences and
Carolyn Hushman is
a post doctoral fellow
in the Department of
Individual, Family, and
Community Education,
all at the University
of New Mexico,
Albuquerque, New
Mexico.*

Students enter a physical education teacher education (PETE) program with a developed conception of what they believe physical education looks and feels like (Hare, 2007; Hutchinson, 1993; Lortie, 1975). This conception is developed during the K-12 experience of the educational process and through life experience outside of the educational system (Hutchinson, 1993; Lortie, 1975). One of the primary goals of a PETE program is to introduce new, innovative ways to teach physical education in order to replace ineffective, archaic practices that may exist in today's physical education settings (Kulinna, 2008).

By educating pre-service teachers about new pedagogical strategies and techniques, the intention is to address and change ineffective practices in physical

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education so that children learn to love movement and engage in regular physical activity for their health and wellness. However, as Lortie (1975) suggests, experience is more powerful than theory and changing beliefs of students entering pre-service teaching programs is challenging and will require a focused effort throughout the program for misconceptions to be addressed.

Conceptual Change

The conceptual change approach to learning can be traced back to Thomas Kuhn (1962) in a book titled *The Structure of Scientific Revolutions*. In his book, Kuhn suggested principles and theories of science education could be classified as a “paradigm” of practices. When new theories and principles are developed that challenge or add to the current paradigm, then a paradigm shift must occur to accommodate the new material. Learned concepts are embedded in paradigms and when a shift in paradigm occurs, the validity of certain concepts may be challenged. The challenging of these concepts is referred to as conceptual change.

Understanding the mechanics behind conceptual change is important in order to address misconceptions students bring with them when entering a PETE program. Strike and Posner (1992) suggest students entering college programs maintain conceptual ecologies, including “anomalies, analogies, metaphors, epistemological beliefs, metaphysical beliefs, knowledge from other areas of inquiry, and knowledge of competing conceptions” (p.150). In the discipline of physical education, these conceptual ecologies might lead to the naïve belief the main focus of physical education is competitive sports or that physical educators only teach because it is a conducive job for coaching a competitive athletic team. Although these beliefs may be naïve misconceptions, they still serve as the foundation for what students entering the PETE program may believe is the primary purpose of physical education.

Using Kuhn’s (1962) initial work in conceptual change as a model, Posner, Strike, Hewson, and Gertzog (1982) designed an instructional theory that defined specific steps students must go through before misconceptions can be changed. These four steps are (1) students must be dissatisfied with the existing conception, (2) students must be presented with a new concept that is understandable, (3) the presented concept must be believable, and (4) the new concept will lead to success. This framework is known as the ‘classical approach’ to conceptual change.

Conceptual Change and PETE Programs

PETE programs attempt to address naïve misconceptions of entering PETE students by first offering information that competes with the misconceptions developed during the recruitment phase of the socialization process. These new concepts are then supported during the professional phase of socialization with discussions of the “new paradigm” in physical education, which offers pre-service

teachers appropriate techniques, practices and theories that are supportive of a more appropriate physical education experience. Pre-service teachers then enter the occupational phase of the socialization process when entering the student teaching practicum. The student teaching experience is where new skills, techniques and theories learned during the undergraduate process can be implemented into a “real” educational setting. This process of teacher education follows the tenants of the classical approach to conceptual change as developed by Posner et al (1982).

Study Purpose

The purpose of this study was to investigate the process of conceptual change as related to the PETE program experience and student teaching practicum. Two physical education student teachers participated during an eight-week long elementary practicum experience. Interviews were conducted with student teachers, their cooperating teachers, the university supervisor, and the program coordinator.

Participant Selection

The two primary participants in this study were undergraduate physical education teacher candidates at a university located in the southwest region of the United States. The participants were placed at the elementary level for the student teaching practicum. The secondary participants in this study were the cooperating teachers supervising the student teachers at the school placement, a university supervisor in charge of supervising the student teachers and communicating with the cooperating teachers, and the program coordinator of the professional physical education teacher preparation program.

PETE Program

The PETE program in which the participants were enrolled was at a university located in the southwest region of the United States. A goal of the professional PETE program was to provide students with the knowledge, skills, and dispositions to be effective teachers. To meet this goal, knowledge of content and pedagogy was delivered through a variety of courses to provide a fundamental understanding of the most basic principles in physical education. Students were immersed in classes that taught curricular models, teaching styles and techniques, lesson, unit and yearly plan development, and other pertinent material that led to the development of sound pedagogical and content knowledge in the domain of physical education. Moreover, students had the opportunity to practice delivering these newly learned skills and practices while teaching peers and home schooled children during the second year, and teaching small lessons in public and private schools during third year field experiences

In regards to elementary level curricular models, teaching styles, standards

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based education and assessment techniques, the PETE program distinguished the Skill Theme Approach (Graham, Holt/Hale, & Parker, 2004) as the primary vehicle to deliver high quality, effective elementary physical education. The Skill Theme Approach is a dynamic curricular model of movement analysis that utilizes skill themes and movement concepts at developmentally appropriate levels. The premise of the model is to allow children to develop basic skills and techniques so they have the foundational components to be lifelong movers.

A primary focus of the PETE program is developing pre-service teachers who can successfully assess student performance through authentic assessment. Authentic assessment is a form of assessment that measures the ability to use skills to solve problems that relate to “realistic” settings (Wiggins, 1989). Providing tasks that are completed in “meaningful context that provides connections between real-world experiences and school-based ideas” is the primary goal of authentic assessment in physical education settings (Lund, 1997, p 26). Characteristics of authentic assessment should include an emphasis on higher order thinking, an opportunity to demonstrate how skills in practice settings relate to success in real performance settings, and a presentation of both the process and product of the learning experience (Lund, 1997).

Methodology

Qualitative inquiry was the utilized research platform for this study because of the exploratory nature of this subject. The data collection sources utilized in this study were interviews, documentation, observation, and physical artifacts. Categorical aggregation (Stake, 1995) was used to analyze the data, resulting in a collection of different instances from various data sources that resulted in the formation of general themes in the research.

Interviews

The portrayal and multiple views of this study were ascertained through interviews with each participant. The purpose of the interviews was to gather descriptions of events and explanations as to what the participants’ believed transpired before, during and after the student teaching practicum. Interviews occurred one time at the end of each week of teaching for each of the student teaching participants, resulting in a total of eight interviews for each participant. Two interviews were conducted with the cooperating teacher participants, resulting in a total of two interviews for each participant.

Interviews with student teachers investigated the understanding of theory as learned during the professional teacher education program before, during and after the student teaching practicum. Interviews with cooperating teachers investigated the understanding of theory the student teacher learned during the professional teacher education program. Moreover, cooperating teachers were asked to examine

how their teaching philosophy aligned with the skills, knowledge, and dispositions taught in the professional preparation program. The interview with the university supervisor investigated perceptions of theory and best practices as instructed to the student teacher during the professional teacher education program. The interview also investigated the impressions of the university supervisor in regards to the student teachers performance, interaction with the cooperating teacher, and overall impression of the student teaching experience. The interview with the program coordinator investigated the program coordinator's philosophy of theory and best practice as instructed to the student teachers during the professional teacher education program before the student teaching practicum.

Observation

The researcher observed each student teacher at the student teaching placement. These placements were at elementary schools located in the southwest region of the United States. The researcher observed each participant a total of 16 times. Each observation included two to three class periods of differing grade levels and class sizes. The researcher utilized an observation tool that separated each area of interest into a column so that observation notes were organized and concise. There was a category for teaching styles, curricular models, standards based education goals, and assessment techniques. The researcher's observations captured details of interactions with students, utilization of teaching styles, incorporation of curricular models, interactions with the cooperating teacher and university supervisor, and other pertinent material in relation to socialization.

Documentation and Physical Artifacts

Document review consisted of: interview transcripts, observation notes, lesson plans, unit plans, and forms of assessment. The goal of documentation was to gather data that could be reviewed and compared to interview and observation data. The artifacts took form of the teacher candidates' journals. The student teacher was asked to journal one time a week for a total of nine weeks. The journal entries asked questions pertaining to the experiences encountered during the student teaching process. Participant journal information was used as a piece of comparison to interviews and observations.

Results

Participant Background

Student teachers. One of the participants was a Hispanic female who was given the pseudonym of Sarah for the purpose of this study. Sarah's interest in pursuing a degree in physical education was ignited during her experience in public school physical education. She believed her physical education teachers were some of the best, most enthusiastic and dynamic teachers she knew during her K-12

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educational experience. It was during the latter part of her high school experience that Sarah had an inclination physical education could be a future career path for her. After leaving high school, Sarah joined the work force before she started her college career, which she believed helped her mature before entering the physical education teacher education program.

When asked specifically about her elementary physical education experience, Sarah suggested her physical education classes were comprised of mainly sports, fitness and games. Although her elementary experience was not reflective of what her PETE program suggested was quality physical education, Sarah still believed the experience encouraged her to be successful and was an acceptable way to teach physical education. Her future teaching goal was to become a successful elementary level physical education teacher.

The second participant in this study was a Caucasian male given the pseudonym of William for the purpose of this study. William's past experience in physical education was very similar to Sarah's. William attended a school with a large number of students designated in a low socio-economic status. It was during this K-12 public school experience that William became interested in a possible career as a physical education teacher. He thought the physical education program was an outlet for many of his peers and saw the significant impact a quality physical education program could have on students. He had excellent rapport with most of his physical education teachers and was excited for an opportunity to develop the same relationship with his own students someday.

When asked specifically about his elementary physical education experience, William suggested his experience was based around sports and fitness. He recalled doing a lot of running but mostly remembered the various sports he played, suggesting sports like soccer, basketball and other various playground games were the predominant activities in his elementary physical education class. He reflected on his elementary experience with great fondness, offering examples of dodge ball and the parachute as activities he enjoyed. William's future teaching goal was to become a high school or middle school physical education teacher. He was also interested in coaching.

Cooperating teachers. William's cooperating teacher, John, was a gentleman with nearly 40 years of public school teaching experience. He was a devoted and passionate physical education teacher who worked at a school comprised of a largely lower socio-economic population. When asked about goals for his students, John enthusiastically stated that fitness through jump rope and exercise should be the most important part of an elementary program and that such goals could not be accomplished without displaying compassion and caring for each and every one of his students.

Sarah's cooperating teacher, Warren, had been teaching at the public school level for over a decade. In addition to his public school teaching experience, he spent two

years working in the state department of public education. His job responsibilities included overseeing the training of elementary physical education teachers who were hired to improve the quality of physical education in schools throughout the state. His proclaimed greatest accomplishment was earning a doctorate of philosophy in physical education. Proudly posted on the walls around his gymnasium were state and national physical education standards, movement concepts and skill themes as derived from the Skill Theme Approach to elementary physical education and a score of other posters and documents suggesting to all who entered his classroom that he conducted a high quality physical education program. When asked about goals for his students, Warren enthusiastically stated that his goal was to help his students develop into mature, lifelong movers and that the skills they learned in his class would allow elementary age students find success in the realm of fitness for a lifetime.

Program coordinator. The program coordinator of the PETE program, given the pseudonym Lyndsie for the purpose of this study, had been a public school teacher for over a decade before taking a position in at the university level as a professor. She is currently an associate professor and the program coordinator of the PETE program. Interview questions revealed the PETE program exposes pre-service physical education teachers to concepts of lesson planning, a variety of teaching styles, effective assessment techniques and current curricular models with a focus on quality physical education experiences. Moreover, pre-service physical education teachers are taught to incorporate NASPE standards and utilize authentic assessments to ensure student achievement.

University supervisor. The university supervisor is a graduate student in the doctoral program at the university in which this study was conducted. This individual, given the pseudonym of Melanie for the purpose of this study, had three years of experience at previous placements observing student teachers in a variety of physical education settings. Melanie had experience working in several different areas of the United States in physical education, which she suggested had enhanced her ability to successfully observe student teachers due to her diverse background. Her graduate training was reflective of the theories and goals as instructed in the PETE program. Interview questions with Melanie revealed her focus regarding supervision was to assure student teachers were incorporating concepts and theories learned during the PETE program into the student teaching practicum. Moreover, Melanie suggested she had a very organized system of observation, which she believed resulted in a highly effective method to offer structured and quality feedback.

Successful Conceptual Change

Before she started her student teaching, Sarah was asked what she understood about the curricular models she learned about during her PETE program:

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We learned lots of models, some more than others. The tactical model, the elementary model with locomotor and movement concepts, the sport model where there are teams. They all make sense, and I really like the idea of how they strive to meet developmental appropriateness. I was told some of the stuff going on at public school in PE is not good, like just rolling the ball out and that makes sense because we saw that first hand during our methods when we visited schools and stuff. I guess I don't really know how I feel about them (curricular models) maybe because it sounds good but I have not seen what they are like with kids. (Sarah, Interview #1)

Sarah had a general understanding of the curricular models she learned about during her undergraduate PETE program. The fact that she thought they “made sense” and contributed to “developmental appropriateness” suggested she supported the idea of the curricular models. Moreover, she understood that practices reflective of “rolling out the ball” in some physical education settings did not provide a quality educational experience. In relation to the idea of conceptual change, Sarah met the first two criteria, showing understanding that some existing practices in physical education did not work and the alternative methods learned during her PETE program “made sense.” Finding evidence of the third criteria of conceptual change would suggest the new concept had been accepted. In an interview during the 5th week of her student teaching placement, Sarah had this comment in regards to curricular models:

I remember learning about the Skill Theme Approach during my coursework in our elementary class. Back then, it actually made a lot of sense; the idea of teaching students basic skills so they can be lifelong movers is such a great idea. Now that I have been working with the model for the past few weeks, it is really awesome and makes so much sense. The kids love it and I get the feeling that if we just did sports stuff like some of the other student teachers are doing in other schools, the kids would not be as successful nor would they have as much fun. (Sarah, Interview #5)

Sarah's cooperating teacher Warren was asked what kind of curricular model he used in his elementary physical education setting before Sarah began her student teaching experience:

I use the Skill Theme Approach. It is the best curricular model for elementary aged children because it teaches them important fundamental skills they will need in order to find success in sports and lifetime fitness activities later on in life. (Warren, Cooperating Teacher)

Sarah was asked to complete a journal entry at the conclusion of her student teaching experience regarding her perceptions of the curricular models learned during her time in the PETE program and how they transferred to the student teaching practicum:

Student teaching was such an amazing opportunity to see how the Skill Theme

Approach would work in a real teaching setting. I was always a little skeptical about such a complicated idea like this (Skill Theme Approach) model. But after I ran the model and saw the students find so much success, it completely makes sense to run this model. Locomotor and manipulative movements are really the absolute essential skills for kids this age and this model (Skill Theme Approach) is truly the best model to do with elementary students. (Sarah, Journal Entry, Week #9)

During the final week of the student teaching experience, Sarah's university supervisor Melanie was asked about the curricular models Sarah learned about during the PETE program and if Sarah used any of these models during her student teaching practicum:

The Skill Theme Approach is the elementary curricular model that the PETE program promotes as the best quality model for elementary age students. Sarah has done an excellent job incorporating the Skill Theme Approach during her time at this student teaching placement. The few times I have spoken with her about the model, she obviously believes the model has worked very well and is excited to be using what she learned about in her PETE program in a real setting. (Melanie, University Supervisor)

Sarah was able to successfully apply the new curricular concept of the Skill Theme Approach (Graham, Holt/Hale, & Parker, 2004) learned in her PETE program to a realistic teaching setting. Therefore, it was evident that all three requirements for conceptual change were met. Sarah was convinced during her PETE program that some curricular models currently used in physical education were inefficient, which met the criteria for the first component of conceptual change. She learned about new curricular models and was able to develop a general understanding of the theoretical underpinnings of the models, which met the criteria for the second component of conceptual change. Finally, Sarah was able to successfully implement the new curricular model into a realistic educational setting that was supportive of the Skill Theme Approach, which met the third and final criteria for conceptual change. This portion of the study suggests Sarah's conceptions about a specific curricular model in physical education did in fact change over the course of her undergraduate educational experience.

Another area in which Sarah experienced conceptual change was authentic assessment. Authentic assessment was discussed with Lyndsie, the program coordinator of the PETE program during an interview before the student teaching placement began. Lyndsie suggested authentic assessment was a pillar of the program due to the importance of using assessment to measure student success and teacher effectiveness. Lyndsie had the following to say about authentic assessment:

I believe it is important that assessment is completed through an authentic means to get a snapshot of what students can achieve in natural sport settings. Authentic assessment is also more useful than traditional methods due to its focus on higher helping students understand how the process of a movement directly affects the end result. The theme of authentic assessment is interwoven throughout the entire

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PETE program, which helps the students understand the importance of measuring student success. (Lyndsie, Program Coordinator)

When asked to describe authentic assessment as learned during the PETE program, Sarah had this to offer:

As I understand it, authentic assessment is testing students in real settings to see if they can actually do the skill in a real game. For example, if I have the students bump a volleyball against the wall, I can see they can do the right techniques for a bump. But how do I know if they can do it in an actual game? So to figure that out, I watch them doing the bump during an actual game to assess if they can do the bump at the correct time. It makes sense though. I completely understand the importance of authentic assessment when helping my students find success in physical education because the skill needs to be used in real games otherwise, what's the point? (Sarah, Interview #1)

During the third and fourth week of the student teaching experience, Sarah was asked to write journal entries about authentic assessment and if she was using it when she was teaching:

I took a course in my (PETE) program that was all about assessment and how to do it. The point was assessment needed to be done in physical education because it really has not been done in past years, which hurts our profession and reputation. We learned a lot about authentic assessment and how to develop rubrics, checklists and tests that we could actually use when we teach. In fact, we developed assessments for tennis and then went and practiced using those tests with some of the college classes in basic activity courses. It was a cool project because it obviously showed strengths and weaknesses of the people we watched. This helped me understand why we use authentic assessments and how to do it. (Sarah, Journal Entry, Week 3)

Sarah displayed a general understanding of the concept of authentic assessment as learned during the PETE program. She showed the ability to differentiate between measuring student performance in an isolated environment as compared to an authentic environment. Moreover, she was able to communicate the importance of a student's ability to perform skills and techniques in authentic situations in order to find success in future sport environments. In relation to the idea of conceptual change, Sarah met the first two criteria, showing understanding that the lack of assessment in physical education was not appropriate and the new methods of assessment learned during the PETE program would be a good method to show student growth in physical education.

During the final week of the student teaching experience, Sarah's university supervisor Melanie was asked about the forms of assessment Sarah learned about during the PETE program and if Sarah used any of these forms of assessment during her student teaching practicum:

One of the cornerstones of the PETE program is the goal of using forms of authentic

assessment whenever possible since it gives a more holistic picture of the student. Sarah did an excellent job using authentic forms of assessment. For example, during her badminton unit, Sarah used a rubric that assessed each student's ability to produce a forehand stroke through a checklist. The neat part was that Sarah defended testing the forehand stroke because she believed it was an essential skill to the student finding success in future games of badminton, which is exactly what she was taught in the PETE program. (Melanie, University Supervisor)

In the case of authentic assessment, all three requirements for conceptual change were met regarding Sarah's experience. Through the theoretical teachings in the PETE program, Sarah understood and accepted the concept and rationale of assessing students through authentic means. She then learned how to develop actual forms of authentic assessments and practice using them during the assessment course in the PETE program. Finally, she was able to successfully apply the theory of authentic assessment to practical settings during her student teaching practicum.

William had a similar experience that supported conceptual change, however his occurred solely in the realm of authentic assessment. When asked during the first week of his student teaching about his knowledge and opinion of authentic assessment, William had this to offer:

From what I remember, authentic assessment is done when the student being watched is actually participating in the activity. You know, when a student is passing a ball to another student in a game situation or something, then I would assess that student on his ability to pass the ball. It sounds good. Why not grade a student when they are actually doing a skill? It seems better than just a basic written test, you know, 'cause you actually see the student doing the stuff and you know they can do it. Sure its different than what I did when I was a kid in school, but it seems better, 'cause written tests were never very good at telling a successful student from a not good one. I saw lots of students, that couldn't play anything very well, getting A's because of the written test. Those were the kids that needed the most help, and they didn't get it. (William, Interview #1)

During weeks four and six of the student teaching experience, William was asked to write journal entries about authentic assessment and if he was using it when he was teaching:

I'm convinced it's a good idea to test students on skills when they are actually playing the game. The point of teaching these kids how to kick a soccer ball is so that they can play soccer someday. I like the idea of testing them while they are actually playing soccer so I can actually see of they know how to do the skills in a real soccer game rather than just kicking a ball to a target. (William, Journal Entry #4)

William's response in both his interview and his journal entry illustrated he believed authentic assessment was a quality way of measuring a student's performance. He also noted that his own experience in public school physical education

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could have been better if he and his peers were graded on forms of authentic assessment instead of basic written testing. William demonstrated dissatisfaction with a traditional method of assessment, such as paper and pencil tests, and found authentic assessment through observation during practice or game playing to be more appropriate. During an interview in the 6th week of the student teaching practicum, William had this to add about authentic assessment:

My teacher doesn't use much assessment, so I have been kind of on my own. But authentic assessment definitely works. Exit slips and worksheets were okay, the kids like those all right. But I was able to really see what students needed help though grading them while they were actually participating in games and stuff. I just kind of checked them off by cues and stuff. By the end you could really tell who needed help. So yeah, authentic assessment works, and I think is a great way to help students and myself get better at learning and teaching. (William, Interview #6)

Even though his cooperating teacher did not use forms of authentic assessment, William discovered that authentic assessment actually worked in a real world, educational setting. William realized that use of written tests, the way he was assessed as a student in public school, was not an effective means of assessing progression of skill attainment. He then learned about authentic assessment during his professional preparation and accepted the practice. Finally, he was able to successfully implement authentic assessment into a real educational setting. This realization suggested William was able to successfully change his conception of assessment.

Failure of Conceptual Change

Both participants experienced challenges to conceptual change. Because William's cooperating teacher did not demonstrate the pedagogical practices emphasized in the PETE program, he experienced more dissonance than Sarah. During the recruitment phase, William participated in activities like dodge ball and kickball when he attended public school. In his professional preparation courses, William was told that such activities were not considered appropriate practice because of rate of participation and exclusion of students. William heard the dialogue that dodge ball and kickball were not quality activities, but never really became dissatisfied with his existing concept of the games. When William perceived the games working well with his classes and being supported by his cooperating teacher, his conception that these activities were appropriate in the elementary curriculum was reinforced. Conceptual change failed for two reasons: (1) William's original misconception that dodge ball and kickball were quality activities did not become dissatisfying and, (2) William witnessed the support of dodge ball and kickball by his cooperating teacher and thus assumed these activities worked well in an elementary setting.

William also experienced failure of conceptual change in the realm of standards based education. When asked how his cooperating teacher utilized NASPE or state standards in his curriculum, William responded:

(laugh) Standards? I don't think he would know a standard if it hit him upside the head. Seriously, all joking aside, he doesn't use standards. I tried to talk with him about it early on and he had no idea what I was talking about. He knows what they are, but doesn't know what they are if you know what I mean. You know though, the guy is an awesome teacher. The stuff he does works well with the kids. During my undergrad classes, I thought the idea of standards was kind of wasteful. They are hard to understand and seem so out there, you know? Don't get me wrong, I get the idea behind them and it's nice to have a guideline if you need one. But I didn't really need them and was just as successful not using them. (William, Interview #6)

During weeks two and six of the student teaching experience, William was asked to write a journal entry about his impressions of using state standards to guide him when determining objectives in lesson plans:

I remember the standards being talked about a lot in my classes as sort of a guide when developing my class lesson plan. Honestly, I never really understood them that well. They were confusing and honestly, seemed a lot like common sense really. I think if I make a good lesson, they will fit in somewhere. John (cooperating teacher) agrees with me about the standards and I have seen other teachers that don't use them too. So I guess I don't see why we are following standards when we do all of that stuff anyway. (William, Journal Entry #2)

It became apparent through an interview with William's cooperating teacher that state and national standards were not considered essential when delivering content in physical education.

I don't directly address standards in my lessons. I looked at the idea one time a while ago, and when I looked at what I am doing, it was obvious I was meeting standards. The standards are very broad so meeting them is relatively easy. I feel standards are more of a smoke screen, a way to make things sound better. I am confident that my kids are learning and active and that is all that matters. (John, Cooperating Teacher, Interview #1)

William understood the purpose of standards based education but admitted a lack of connection to the importance of aligning standards when developing curriculum and teaching. In addition, his cooperating teacher John did not reinforce the benefits of standards based education. Conceptual change failed for three reasons: (1) William was never convinced that standards based education was important, (2) The theory of standards based education instructed by the PETE program did not seem feasible to William, and (3) William never witnessed the success of standards in a real educational setting.

William also experienced negative conceptual change in the realm of curricular models. William's elementary methods course was devoted to educating future physical education teachers about the practical delivery of the Skill Theme Approach. Students practiced delivering lessons developed through the lens of this model to peers and through a weekly on-campus practicum with homeschooled

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children, ages 3-12. Practice lessons were prepared according to a skill theme, such as 'throwing' and students could determine the most developmentally appropriate means of throwing to meet the ability of the children assigned to teach. When William arrived at his student teaching school, he saw all children being taught the same lessons with no modifications for varying levels of ability.

Well, I don't really run one of the new models you all talk about at the college level. I would say my curriculum is based around fitness and skill development. We do jump rope a lot because of the healthy impact and skill development of these kids. But no, I really don't run a specific model. Hey, I'm old (laugh) (John, Cooperating Teacher, Interview #1)

Although John did not utilize a specific curricular model, field notes suggested the development of his lessons and activities were most reflective of the multi-activity model. The multi-activity model is a primarily sports and games-based model that would not be considered an appropriate model to use during elementary physical education by the PETE program because all children receive instruction the same way, regardless of skill level. Because William never observed successful modification of instruction to meet the ability level of all children in any class, he perceived his command style delivery of sports and games to be an effective means of instruction. In this situation, negative conceptual change occurred because William never really became proficient implementing the Skill Theme Approach prior to the student teaching experience and was not offered an opportunity to utilize it during the student teaching setting. Consequently, William maintained his previous conception of quality elementary education.

Summary

This study suggests the PETE program and student teaching practicum have a great impact on the development of new conceptions in physical education. Sarah entered the PETE program with a preconceived notion of what quality elementary physical education should look like. During the PETE program, she learned about new, high quality, effective practices that challenged her preconceived notions but did not fully convince her that her current beliefs were not valid. When she entered the student teaching practicum, her cooperating teacher was supportive of the new concepts she learned during the PETE program, which encouraged Sarah to accept the new concepts learned during her PETE program. This led to the successful implementation of the new practices and theories learned during the PETE program into her student teaching practicum.

William had similar beliefs as Sarah entering the PETE program. He believed the practices and theories taught to him during his elementary experience were a quality way of teaching physical education even though his PETE program disagreed. The PETE program taught William new ways in which to deliver high quality, effective physical education. William understood but did not fully believe

in these new practices and theories learned during the PETE program. When William entered his student teaching practicum, he was confronted by a placement that utilized practices and theories reflective of William's recruitment experience and not his PETE program experience. As a result of this, William washed-out to using some practices reflective of his own experience in elementary physical education and not the practices and theories learned during the PETE program.

Discussion

This study sheds light on the theory of Kuhn's (1962) conceptual change model as it relates to the educational process of a pre-service teacher education program. Many instructors of professional preparation programs believe a general goal of a PETE program is to help each student develop new beliefs and understandings that challenge inappropriate practices in physical education (Lawson, 1986). Kuhn (1962) suggested the goal of any teacher education program is to change current beliefs and conceptions that support an ineffective model of education, which he defines as conceptual change. The analysis in this study is congruent with Kuhn's (1962) and Posner et al (1982) criteria for successfully inducing conceptual change.

The PETE program attempted to change William and Sarah's current misconceptions about the practices and theories involved with quality physical education. Sarah and William showed an understanding and willingness to try the new practices and theories learned in the PETE program but were skeptical they would find success in a real educational setting. When Sarah and William entered the student teaching practicum, Sarah encountered support for the practices and theories learned during the PETE program, while William did not. At the conclusion of the student teaching practicum, Sarah had fully accepted the new practices and theories learned during the PETE program while William washed-out to practices he experienced as a student in a physical education class. This finding is important as it suggests the student teaching placement has a direct influence on the successful change of misconceptions students bring into a PETE program.

The findings in this study eluded that changes in PETE programs may be necessary in order to address misconceptions about physical education. PETE programs currently have courses that challenge current misconceptions. However, aspects of the student teaching placements in which pre-service teachers are immersed may at times not be reflective of the PETE programs practices and theories. Some aspects of the student teaching environment may not be reflective of the PETE program goals for new physical education teachers and so may lead to failure of conceptual change, which will ultimately lead to washout to inappropriate theories and practices.

The goal of conceptual change in a PETE program is to modify existing beliefs about physical education so they are reflective of higher quality practices. Conceptual change starts when the pre-service teacher enters the teaching program.

Exploring the Process of Conceptual Change

Specific elements with intent to encourage conceptual change should be added to PETE curricular models in order to replace the misconceptions of quality physical education learned during the K-12 educational experience.

Implications for future research would be to further explore the theory of conceptual change as it relates to students beliefs entering the PETE program. This exploration might begin with a developed survey or tool that measures existing misconceptions of students entering a physical education teacher education program. The data from this survey or tool could then be used to diagnose specific origins of misconceptions in order to allow PETE programs to develop curricula that may encourage conceptual change.

References

- Graham, G., Holt/Hale, S., & Parker, M. (2004). *Children moving: A reflective approach to teaching physical education*. New York: McGraw Hill.
- Hare, M. (2007). Diagnosing student misconceptions in physical education. *Indiana Association for Health, Physical Education, Recreation & Dance Journal, Winter*, 36, 39-41.
- Hutchinson, G. E. (1993). Prospective teachers perspectives on teaching physical education: An interview study on the recruitment phase of teacher socialization. *Journal of Teaching Physical Education*, 12, 344-354.
- Kuhn, T. (1962). *The structure of scientific revolutions*. Chicago: University of Chicago Press.
- Kulinna, P. (2008). Models for curriculum and pedagogy in elementary school physical education. *Elementary School Journal*, 108(3), 219-227.
- Lawson, H. A. (1986). Occupational socialization and the design of teacher education programs. *Journal of Teaching Physical Education*, 5(1), 107-116.
- Lortie, D. (1975). *Schoolteacher: A sociological study*. Chicago: University of Chicago Press.
- Lund, J. (1997). Authentic assessment: Its development and applications. *The Journal of Physical Education, Recreation and Dance*, 68(7), 25-28
- Posner, G. J., Strike, K. A., Hewson, P. W., & Gertzog, W. A. (1982). Accommodation of a scientific conception: Toward a theory of conceptual change, *Science Education*, 66, 211-228.
- Stake, R. (1995). *The art of case research*. Thousand Oaks, CA: Sage.
- Strike, K. A., & Posner, G. J. (1976). Epistemological perspectives on conceptions of curriculum organization and learning. In *Review of Research in Education*, edited by Lee Shulman. Itasca, IL: F. E. Peacock.
- Wiggins, G. (1989). A true test: Toward more authentic and equitable assessment. *Phi Delta Kappan*, 70, 703-713.