

Developing Reflective Practice in Preservice Teachers: Influence of a Data-Based Intervention

Seidu Sofu

Beth Easter

Department of Health, Human Performance and Recreation
Southeast Missouri State University
Cape Girardeau, MO 63701, USA

Abstract

The study assessed the extent to which a data-based intervention influenced preservice physical education teachers' (PPETs) reflective capabilities during peer teaching. Participants included three intact cohorts of 51 PPETs enrolled in a middle school physical education methods course at different times. Cohort 1 (n = 17) served as the control group and Cohort 2 (n = 18) and Cohort 3 (n = 16) served as the experimental groups. PPETs planned and taught in pairs or groups of threes, two lessons. All lessons were videotaped. Each PPET submitted two reflection papers. The two experimental groups watched and coded videotapes of their first lessons using the Instrument for Identifying Teaching Styles (IFITS) prior to writing their first reflection papers. Furthermore, Cohort 3 watched and coded videotapes of their second lessons. PPETs' reflection papers were coded using an analytic scoring guide consisting of three indicators— Reflective Cycle, Future Teaching, and Use of Available Resources. The coded data were analyzed using descriptive and inferential statistics. Results indicated that the overall mean scores for Cohort 2 and Cohort 3 increased from 5.50 to 6.00 and from 5.94 to 7.00 respectively. That of Cohort 1 increased from 4.76 to 5.06. Paired Samples t-Test analyses showed that the mean difference for Cohort 3 was statistically significant ($p = .001$), while those of Cohorts 1 and 2 were not. Watching and coding their own teaching twice did improve (once did not) PPETs' scores on the reflective assignment. Providing continuous data-based interventions can improve PPETs' reflective abilities.

Keywords: Peer teaching, physical education, teacher education, teacher reflection

1.0 Introduction

Reflection upon practice is one of the keystones of teacher education programs in the last two decades (Korthagen & Vasalos, 2005; Tsangaridou & O'Sullivan, 1997). Despite the consensus on its importance in learning to teach, there are varying views on the nature of reflection (Molander, 2008). Sparks-Langer and Colton (1991) identified three elements of reflection: cognition, critical reflection, and narrative inquiry. Cognition focuses on how teachers use knowledge in decision-making. Critical reflection addresses issues that guide teacher thinking such as their beliefs and experiences. Narrative inquiry refers to the interpretations teachers make of their own works. Van Manen (1991) categorized reflective practice into three types: retrospective reflection based on past actions, anticipatory reflection relating to future actions, and contemporaneous reflection (reflection in action). Yet still, Tsangaridou and O'Sullivan (1994) defined the reflective process as technical (instructional and managerial aspects of teaching), situational (contextual factors), and sensitizing (social, ethical, and political aspects of teaching).

Scholars and researchers agree that teaching effectiveness entails more than being a technician (van Manen, 1995). Skillful reflection requires deliberate instruction, guidance, and practice on a continuous basis (Beyer, 1987). Thus, teacher educators should explicitly teach reflection, rather than just telling preservice teachers to reflect (Russell, 2005). Larrivee (2000) noted that self-reflection and critical inquiry are essential components of critical reflection. Preservice physical education teachers (PPETs) need to regularly engage in self-reflection involving examining core beliefs, only then would they critique their beliefs and practices.

This process is critical for the professional development of PPETs since their core beliefs are difficult to change (Doolittle, Dodds, & Placek, 1993).

Research suggests two important factors that could enhance reflection— pedagogical strategies and context for reflection. Common pedagogical strategies to promote reflection have included systematic observation, written, verbal, and visual feedback (King, 2008; McCollum, 2002), and dilemma analysis (Talanquer, Tomanek, & Novodvorsky, 2007). King (2008), for example, has shown visual feedback to be a strong stimulus for critical reflection. As Sherin (2000) noted, videotapes help teachers review their own teaching without the demands of teaching. Contexts for teaching reflection have included: field experiences, microteaching and student teaching (McCollum, 2002; Tsangaridou & O'Sullivan, 1997).

1.1 Reflection in Physical Education Teacher Education

Most studies on PPETs' reflective practices have been conducted in methods courses (Standal & Moe, 2013). Research indicates that PPETs find it difficult to reflect critically. While Curtner-Smith and Sofo (2004) reported that PPETs and preservice classroom teachers (Curtner-Smith, 2007) focused on technical rather than critical reflection, Garret and Wrench (2008) indicated some participants in their study engaged in critical reflection. Not only are PPETs' abilities to reflect limited (Ballard & McBride, 2010), but they also tend to focus on the techniques of teaching (Napper-Owen & McCallister, 2005). To date, research suggests mixed results in identifying effective strategies that would assist PPETs' reflectivity. The present study was an attempt to assess the impact of a data-based intervention on PPETs' reflective capabilities in the context of peer teaching.

1.2 Purpose of the Study

The present study focused on engaging PPETs in retrospective and anticipatory reflection (van Manen, 1991) and critical reflection (Sparks-Langer & Colton, 1991; Tsangaridou & O'Sullivan, 1994). Retrospective reflection, what Schön (1987) called 'reflection-on-action' refers to what teachers could do to change actions that did not go well in their classrooms. Anticipatory reflection was pertinent to the present study since it refers to strategies teachers would use to change their actions in the future— Schön (1987) termed it "reflection for action." Therefore, the purpose of the study was to assess the extent to which a data-based intervention influenced preservice teachers' reflective practice during peer teaching. Specifically, it investigated the extent to which watching and coding videotapes of their own lessons would improve PPETs' abilities to use the reflective cycle, which involves description of teaching, justification of the teaching performance, and critique of the teaching performance (NASPE, 2001, 2008). Creating opportunities for PPETs to engage in critical reflection would help them understand the relationship between their thoughts and actions (Farrell, 2001). This understanding would help them translate theory into action in the field.

1.3 Research Questions

The study utilized the following research questions:

1. To what extent would a data-based intervention influence PPETs' abilities to describe and critique their teaching performance?
2. To what extent would a data-based intervention influence PPETs' abilities to set teaching goals for enhancing student learning?
3. To what extent would a data-based intervention influence PPETs' abilities to use wide variety of resources such as peers, literature, and university instructor to continue to develop as reflective teachers?

2.0 Method

2.1 Participants and Setting

Participants included three intact cohorts of 51 (29 males and 22 females) preservice physical education teachers (PPETs) enrolled in a middle school physical education methods course at different times. Cohort 1 (n = 17) served as the control group and Cohort 2 (n = 18) and Cohort 3 (n = 16) served as the experimental groups. PPETs in all cohorts were required to plan and team-teach, in pairs or groups of threes, two lessons to their peers. The lessons lasted from 12 to 15 minutes. All lessons were videotaped. PPETs' (all cohorts) peers and the course instructor provided written feedback to each pair or group of PPETs after each lesson. In addition, each PPET was required to write a reflection paper, after each lesson, using the following prompts: 1. What instructional and managerial strategies worked or did not work, and why? 2. How do you plan to handle similar situations in the future? 3. Comment on how you used the literature, feedback from your peers and/or the course instructor to improve upon your teaching.

2.2 Intervention

In addition to the written feedback, the two experimental groups (Cohorts 2 and 3) watched and coded videotapes of their first lessons using the Instrument for Identifying Teaching Styles (IFITS) (Curtner-Smith, Hasty, & Kerr, 2001) prior to writing their first reflection papers. Furthermore, PPETs in Cohort 3 watched and coded videotapes of their second lessons using the IFITS prior to writing their second reflection papers— those in Cohort 2 did not.

The authors received approval for the study from the Institutional Review Board at their university. PPETs voluntarily provided written consent for their participation in the study.

2.3 Data Analysis

PPETs' reflection papers were coded using an analytic scoring guide consistent with the guidelines for the Standards for Initial Programs in Physical Education Teacher Education (NASPE, 2001, 2008). The scoring guide consisted of three indicators— Reflective Cycle, Future Teaching, and Use of Available Resources. The authors randomly selected and independently coded 12 reflection papers (four from each cohort). The inter-rater reliabilities attained were Reflective Cycle(88.24%), Future Teaching(94.12%), and Use of Available Resources (82.35%). After establishing reliability, the first author coded all 51 reflection papers.

The quality of each reflection paper was determined by coding each indicator as 1, 2, or 3 for Poor, Good or Excellent respectively. The Reflective Cycle indicator was intended to assess PPETs' abilities to describe and critique their teaching performance. To score a "3" for this indicator, a reflection must have analyzed what strategies worked or did not work, and why these strategies were successful or unsuccessful. The Future Teaching indicator examined PPETs' ability to apply what was learned from teaching their lessons to future teaching. To score a "3" for this indicator, a reflection must have described specific plans for improving the lesson and set teaching goals for enhancing student learning. The Use of Resources indicator assessed PPETs' ability to utilize varied resources to develop as reflective practitioners. A reflection must have provided evidence of the use of a wide variety of resources in planning and teaching subsequent lessons in order to score a "3" (NASPE, 2001, 2008).

Next, the scores for the three indicators were summed to provide an overall score for each reflection paper. Finally, the coded data for each cohort were analyzed using descriptive and inferential statistics. Specifically, comparisons were made among cohorts by examining group means and Paired Samples t-Test analyses across the first and second sets of lessons taught by each cohort. The comparisons were intended to assess the impact of the intervention on PPETs' reflective abilities in each of the three indicators.

3.0 Results

3.1 Overall Mean Scores

Table 1 presents pre- and post-intervention overall mean scores for the three cohorts. Data indicated that the overall mean scores for Cohort 2 and Cohort 3 (experimental groups) increased from 5.50 to 6.00 and from 5.94 to 7.00 respectively. That of Cohort 1 (control group) increased from 4.76 to 5.06. Paired Samples t-Test analyses further showed that the mean difference for Cohort 3 was statistically significant ($p = .002$), while those of Cohorts 1 and 2 were not.

3.2 Reflective Cycle

Table 2 shows pre- and post-intervention mean scores for the Reflective Cycle indicator. The data indicate that the mean scores for Cohort 2 and Cohort 3 increased from 2.33 to 2.60 and 2.31 to 2.88 respectively. That of Cohort 1 (control group) increased from 2.24 to 2.29. Paired Samples t-Test analyses showed the mean difference for Cohort 3 was statistically significant ($p = .001$), while those of Cohorts 1 and 2 were not.

3.3 Future Teaching

Pre- and post-intervention mean scores for the indicator Future Teaching are presented in Table 3. The data indicate that the mean scores for Cohort 2 and Cohort 3 increased from 2.06 to 2.17 and 2.19 to 2.56 respectively. That of Cohort 1 (control group) increased from 1.47 to 1.53. Paired Samples t-Test analyses showed that the mean difference for Cohort 3 was statistically significant ($p = .007$), while those of Cohorts 1 and 2 were not.

3.4 Use of Available Resources

Pre- and post-intervention mean scores for the indicator Use of Available Resources are presented in Table 4. The data indicate that the mean scores for Cohort 2 and Cohort 3 increased from 1.11 to 1.14 and 1.44 to 1.56 respectively. That of Cohort 1 (control group) increased from 1.06 to 1.12. Paired Samples t-Test analyses showed that the mean difference for all three cohorts were not statistically significant.

3.5 Summary of Results

While the overall mean scores for all cohorts increased from pre- to post-intervention, only that of Cohort 3 was statistically significant. Furthermore, the mean difference between pre- and post-intervention on all three indicators for Cohort 1 and Cohort 2 were not significant. In contrast, mean differences on Reflective Cycle and Future Teaching for Cohort 3 were significant, while that of Use of Available Resources was not.

4.0 Discussion and Conclusions

The current study investigated the extent to which a data-based intervention influenced PPETs' abilities to describe, critique their teaching performance, and set goals for future lessons. Watching and coding their own teaching twice did significantly improve (once did not improve) PPETs' overall scores on the reflective assignment. Consistent with King's (2008) finding, visual feedback (video analysis) to a large extent served as a strong stimulus for improving PPETs' reflective practice. This is important for PPETs, especially for those who needed more motivation to reflect. The fact that PPETs had to code their lessons twice, rather than once, to increase their overall reflective capabilities supports the assertion that it takes sustained instruction and practice for teacher candidates to develop their reflective capacities.

The data-based intervention had varying degrees of impact on the three indicators of reflection. It significantly impacted their reflective abilities in the Reflective Cycle and Future Teaching, but not the Use of Available Resources. That is, it improved their abilities to critique their teaching performance and set goals for subsequent lessons. Alternatively, it did not significantly increase their abilities to use varied resources such as feedback from their peers and the course instructor to continue to grow as reflective practitioners. This is consistent with the finding that PPETs need interventions of more than one semester duration to help their reflectivity (Senne & Rikard, 2004). For as Beyer (1987) noted, PPETs require continuous guidance and practice to develop their reflective capabilities.

PPETs' inability to increase their capabilities to use varied resources to develop as reflective teachers post intervention is worth noting. They did not articulate the benefits of feedback generated by their peers or the course instructor. Unlike PPETs in the present study, those in King's (2008) study viewed peer-generated feedback as valuable in developing their teaching skills. Perhaps as Wackerhausen (2008) (cited in Standal & Moe, 2013) suggested, the PPETs' reflections were guided by their interests, motivations, and value orientations. Since PPETs' entry beliefs are difficult to change (Doolittle et al., 1993), those in the present study might have viewed feedback from their peers or the course instructor as inconsistent with their conceptions of teaching and learning. It is important that prospective teachers dialogue regularly with their peers and university supervisors in learning to develop their reflectivity (Rhine & Bryant, 2007).

The present study utilized a written assignment to capture PPETs' reflectivity. The assumption for using this media of reflection is that PPETs are capable of effectively articulating their reflective abilities in a written assignment. However, as Standal and Moe (2013) rightly asserted, there is the need to supplement this mode of capturing reflectivity with interviews and observations. Future researchers would do well to assess PPETs' reflective capabilities over a period longer than one semester. In addition, examining their reflective abilities in a longitudinal manner would provide richer understanding of pedagogical strategies and contexts that could enhance the process.

Results indicated that the data-based intervention, to a large extent, improved the reflective capabilities of the PPETs. In addition, the data suggest that interventions need to last longer than one semester to significantly improve their abilities to reflect on their teaching. Providing PPETs with the opportunity to watch and code their own lessons on a continuous basis has potential to improve their abilities to critique their teaching performance and set goals for future lessons. That is, continuous data-based interventions can significantly improve PPETs' reflective capabilities.

References

- Ballard, K. K., & McBride, R. (2010). Promoting preservice teacher reflectivity: Van Manen may represent a viable model. *Physical Educator*, 67, 58-73.
- Beyer, B. K. (1987). *Practical strategies for the teaching of thinking*. Boston, MA: Allyn Bacon
- Curtner-Smith, M. D. (2007). The impact of a critically oriented physical education teacher education course on preservice classroom teachers. *Journal of Teaching in Physical Education*, 26, 35-56.
- Curtner-Smith, M. D., Hasty, D., & Kerr, I. (2001). Teachers' use of productive and reproductive teaching styles prior to and following the introduction of the National Curriculum in Physical Education. *Educational Research*, 43(3), 333-349.
- Curtner-Smith, M. D., & Sofo, S. (2004). Influence of a critically oriented methods course and early field experience on preservice teachers' conceptions of teaching. *Sport, Education and Society*, 9, 115-142.
- Doolittle, S. A., Dodds, P., & Placek, J. H. (1993). Persistence of beliefs about teaching during formal training of preservice teachers. In S. Stroot (Ed.), Socialization into physical education [Monograph]. *Journal of Teaching in Physical Education*, 12, 355-365.
- Farrell, T.S.C. (2001) Tailoring reflection to individual needs. *Journal of Education for Teaching*, 27(1), 24-38.
- Garret, R., & Wrench, A. (2008). Connections, pedagogy and alternative possibilities in primary physical education. *Sport, Education and Society*, 13, 39-60.
- Janssen, F., de Hullu, E., & Tigelaar, D. (2008). Positive experiences as input for reflection by student teachers. *Teachers and Teaching: theory and practice*, 14(2), 115-127.
- King, S. E. (2008). Inspiring critical reflection in preservice teachers. *Physical Educator*, 65(1), 21-29.
- Korthagen, F., & Vasalos, A. (2005). Levels in reflection: Core reflection as a means to enhance professional growth. *Teachers and Teaching: Theory and Practice*, 11(1), 47-71.
- Larrivee, B. (2000). Transforming teaching practice: Becoming the critically reflective teacher. *Reflective Practice*, 1(3), 293-307.
- McCullum, S. (2002). *The reflective framework for teaching in physical education: A pedagogical tool*. *Journal of Physical Education, Recreation & Dance*, 73(6), 39-42.
- Molander, B. (2008). "Have I kept inquiry moving?" On the epistemology of reflection. *Phenomenology and Practice*, 2, 4-23.
- Napper-Owen, G., & McCallister, S. (2005). What elementary physical education student teachers observe and reflect upon to assist their instruction. *Physical Educator*, 62(2), 76-84.
- National Association for Sport and Physical Education. (2001). *Guidelines for teacher preparation in physical education: NASPE/NCATE guidelines* (5th ed.). Reston, VA: Author.
- National Association for Sport and Physical Education. (2008). *National standard and guidelines for physical education teacher education*, (3rd ed).
- Rhine, S. & Bryant, J. (2007). Enhancing pre-service teachers' reflective practice with digital video-based dialogue. *Reflective Practice*, 8(3), 345-358.
- Russell, T. (2005). Can reflective practice be taught? *Reflective Practice*, 6(2), 199-204.
- Schon, D. (1987). *Educating the reflective practitioner: Toward a new design for teaching and learning in the professions*. San Francisco: Jossey-Bass.
- Senne, T. A., & Rikard, G. L. (2004). A developmental intervention via the teaching portfolio: Employing the teaching/learning framework. *Journal of Teaching in Physical Education*, 21, 309-336.
- Sherin, M. (2000). Viewing teaching on videotape. *Educational Leadership*, 57(8), 36-38.
- Sparks-Langer, G. & Colton, A. (1991) Synthesis of research on teachers' reflective thinking, *Educational Leadership*, 48 (6), 37-44.
- Standal, O. F., & Moe, V. F. (2013). Reflective practice in physical education and physical education teacher education: A review of the literature since 1995. *Quest*, 65, 220-240.
- Talanquer, V., Tomanek, D., & Novodvorsky, I. (2007). Revealing Student Teachers' Thinking through Dilemma. Analysis. *Journal of Science Teaching Education*, 18(3), 399-421.
- Tsangaridou, N., & O'Sullivan, M. (1994). Using pedagogical reflective strategies to enhance reflection among preservice physical education teachers. *Journal of Teaching in Physical Education*, 14(1), 13-33.

Tsangaridou, N., & O'Sullivan, M. (1997). *The role of reflection in shaping physical education teachers' educational values and practices. Journal of Teaching in Physical Education, 17*, 2-25.

vanManen, M. (1991). Reflectivity and the pedagogical thinking and acting. *Journal of Curriculum Studies, 23*(6), 507-536.

vanManen, M. (1995) On the epistemology of reflective practice, *Teachers and Teaching: Theory and Practice, 1*(1), 33–50.

Table 1: Pre- and Post-Intervention Overall Mean Scores for the Three Cohorts (n = 51)

Group	Pre-Intervention		Post-Intervention		t-Test	
	M	SD	M	SD	t	p
Cohort 1	4.76	1.03	5.06	1.09	-.110	.289
Cohort 2	5.50	1.15	6.00	.840	-1.37	.187
Cohort 3	5.94	.92	7.00	.97	-3.78	.002*

* p < .01

Table 2: Pre- and Post-Intervention Mean Scores for Reflective Cycle (N = 51)

Group	Pre-Intervention		Post-Intervention		t-Test	
	M	SD	M	SD	t	p
Cohort 1	2.24	.66	2.29	.59	-.32	.750
Cohort 2	2.33	.69	2.60	.46	-1.69	.110
Cohort 3	2.31	.48	2.88	.34	-4.39	.001*

* p < .01

Table 3: Pre- and Post-Intervention Mean Scores for Future Teaching (N = 51)

Group	Pre-Intervention		Post-Intervention		t-Test	
	M	SD	M	SD	t	p
Cohort 1	1.47	.51	1.53	.51	-4.44	.668
Cohort 2	2.06	.54	2.17	.38	-.81	.430
Cohort 3	2.19	.40	2.56	.51	-3.09	.007*

* p < .01

Table 4: Pre- and Post-Intervention Mean Scores for Use of Available Resources (N = 51)

Group	Pre-Intervention		Post-Intervention		t-Test	
	M	SD	M	SD	t	p
Cohort 1	1.06	.24	1.12	.33	-.57	.579
Cohort 2	1.11	.32	1.14	.32	-.57	.579
Cohort 3	1.44	.51	1.56	.62	-.81	.432