
Collaborative Professional Development School (PDS) Action-Research Classroom Studies for Change and Improvement

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Abstract: In this article, the authors present their collaborative PDS action research aimed at changing and improving classroom teaching directed at pupil learning and achievement. The classroom action-oriented studies take place within a two-year New York State grant project funded with Race-to-the-Top monies for strengthening teacher and leader effectiveness. Two of the 29 classroom studies included in the project are featured in this article. One action study focuses on third-grade mathematics. The collaborators of the study aim to increase pupil engagement through differentiated instruction and then link it to pupil achievement in solving word problems in mathematics. In the second study, two fourth-grade teachers and a teacher candidate collaborate to improve the quality of their pupils' writing and identify the impacts of transferring the editing and assessment process from teachers to pupil(s). Sample data and findings from the two studies are presented.

KEYWORDS: clinical experiences, school-university partnerships, professional development schools, action study, field experiences, observational tools, frameworks, pupil engagement

NAPDS NINE ESSENTIALS ADDRESSED:

1. A comprehensive mission that is broader in its outreach and scope than the mission of any partner and that furthers the education profession and its responsibility to advance equity within schools and, by potential extension, the broader community;
2. A school–university culture committed to the preparation of future educators that embraces their active engagement in the school community;
3. Ongoing and professional development for all participants guided by need;
4. A shared commitment to innovative and reflective practice by all participants;
5. Engagement in and public sharing of the results of deliberate investigations of practice by respective participants
6. An articulation agreement developed by the respective participants delineating the roles and responsibilities of all involved; and
7. A structure that allows all participants a forum for ongoing governance, reflection, and collaboration;

8. Work by college/university faculty and P–12 faculty in formal roles across institutional settings; and
9. Dedicated and shared resources and formal rewards and recognition structure.

Introduction

In this article, teachers and researchers describe their collaborative Professional Development School (PDS) action research aimed at changing and improving classroom teaching directed at pupil learning and achievement. The classroom studies took place within a larger research study that was housed in a New York State (NYS) grant project funded with Race-to-the-Top (RttT) monies.¹ The project, entitled *CLIPS – Career Ladder Innovator Programs and System*, was based in a 14-year old, holistic PDS Partnership between Dowling College and the North Babylon School District (NBSD) in New York.² Throughout the years of the partnership, and specifically the partnership with the Belmont Elementary PDS, its members have used classroom inquiry tools and procedures developed by Catelli (2010b) for conducting a number of the partnership's PDS video-based action research studies.³ The data and findings from the studies were used to initiate, monitor, and demonstrate change and improvement in (a) classroom teaching, (b) the teacher preparation program, (c) program accreditation, and (d) the organizational structure and operation of the PDS partnership between the college and school district. Over the years of the PDS partnership, its members have successfully accomplished:

- The initial preparation of over 200 teacher candidates using the holistic-partnership approach.⁴ The clinical program was cited as exemplary in two reviews of the National Council for the Accreditation of Teacher Education (NCATE).
- Provision of services to over 3,000 youngsters including improvement in test scores.
- Over 55 action-research studies to initiate change and improvement.
- Numerous publications of books, chapters, and articles.
- Frequent speaking engagements and research presentations at national and international conferences.
- A digital library of over 100 video recordings of classroom teaching, and a data bank of action-research findings.

Largely because of the partnership's successful track record, the school district won over one half million dollars of RttT monies from NYS to fund the *CLIPS* grant project. Classroom action studies were an important part of the project. Two of the 29 classroom studies included in the *CLIPS* grant project are spotlighted in this article. The studies involved analyzing pupil data, assessing video-recorded lessons of classroom teaching, and then measuring the changes that took place over time.⁵ The teachers who conducted the studies have been PDS teachers and action researchers for many years. They collaborated with their teacher candidates and the project's resident professor and PDS director-researcher to conduct the studies. Using a variety of observational tools, validated teaching rubrics, and pre-and-post exam scores, changes in classroom instruction and pupil performances were measured over a three-month period of time. Video-recordings of teaching performances, as well as pupil performance on exams, exit tickets, and worksheets were all used as primary sources of data to measure change and provide evidence

of improvement. Additional sources of data such as written lesson plans and pupil survey responses were also examined and used as evidence of positive instructional change and pupil achievement. All 29 teachers of the *CLIPS* project employed action research methodology and video-based classroom inquiry tools to conduct their studies.

The two *CLIPS* teachers whose studies are featured in this article are third, and fourth-grade teachers at the Belmont Elementary PDS. They are the second and third authors of this article. In the following sections, each teacher in her own voice will provide more information about her classroom action study. Sample data and findings will also be given. The two teachers have extensive experience in PDS work. They have served as PDS supervisors, course instructors, seminar leaders, action researchers, and conference speakers. Also, each has been a recipient of the *Claudia A. Balach Teacher Researcher Award* sponsored by the PDS Research Special Interest Group of the American Educational Research Association. I, the lead author of this article, have also received the award. I have written this introduction, and I should mention that I have served as the director of the holistic PDS partnership for over 16 years.

In performing the grant activities, and in conducting their studies, each of the two PDS teachers was assessed at a high level. Their performances were assessed at a high level in that they were able to make linkages between their instructional actions and pupil learning and achievement. They were able to do so more often than others in the project who were just beginning to prepare their classrooms as PDS classrooms. Also, they guided and counseled others during the *CLIPS* workshops and course-experiences, oftentimes drawing upon their own PDS experiences and leadership skills. It should be noted that all of the 29 teachers who volunteered for the grant project were required to participate in a series of *CLIPS* training workshops and a graduate course. The workshops and course were aimed at developing analytic data skills, leadership practices, and research competencies. The skills and competencies (e.g., observing and assessing classroom teaching) are related to the national *Teacher Leader Model Standards* (Teacher Leadership Exploratory Consortium, 2008), and a set of adapted Standards for PDS Teacher-Leader Innovators (see Catelli, Carlino, Petraglia, Calascibetta, Marino & Jackson, 2017 for the adapted Standards). Also, they are the skills and competencies that were embedded in the *CLIPS* professional positions identified on the new career ladder for teachers. All 29 teachers were in training for the new position of Teacher-Leader Innovator. Their classrooms ranged in grade levels from elementary to secondary, and were categorized as either emerging or established PDS classrooms.

One of the goals of the grant-funded project was to prepare teachers to collaborate with one another in Action Teams for conducting change and improvement at the classroom, school, and district levels. Teacher inquiry and collaborative action research were critical components of the project and important to actualizing that goal (Catelli, 1995). The challenge was to have teachers engage in classroom action studies and coach others to do so effectively, while concurrently having them design those same studies to contribute data to school and district improvement. In order to meet the challenge, the 29 teachers in training needed to first demonstrate during the *CLIPS* graduate course that they were able to collaborate with one another and make positive change occur in their classrooms. The two studies presented in this article are representative of that agenda. The studies, as well as the other 27 *CLIPS* classroom studies, were initiated by the following research-inquiry questions:

- What changes and/or improvements in instructional actions would you (the in-service teacher) want to make in your classroom that would favorably impact pupil learning and achievement, and strengthen or change your teacher candidate's teaching performance?
- Did change and/or improvement occur over the period of time (three months) allotted for the study? What evidence do you have to support that change did occur in the desired direction?
- How was time spent during a lesson, and how well did the teacher candidate (or the candidates as a group) perform the instructional actions (or rubrics) that were targeted for change and improvement?

The first study presented below focuses on third-grade mathematics. The PDS teacher and teacher candidate co-taught the lessons of a unit of instruction in mathematics with the teacher candidate oftentimes taking the lead role for teaching the lessons. This classroom study was aimed at increasing pupil engagement through differentiated instruction and linking classroom instructional actions to pupil achievement in solving word problems in third-grade mathematics.

The second study was conducted in two, fourth-grade classrooms. In this study, two fourth-grade teachers and a teacher candidate collaborated with one another to improve the quality of their pupils' writing, and to identify the impacts of transferring the editing process from teacher to pupil(s). One of the teachers is the third author of this article. Data were collected regarding (a) pupils' classroom performances, (b) performance scores obtained from writing an explanatory paragraph, (c) pupils' knowledge of simple machines, and (d) the two teachers' and teacher candidate's rubric ratings of their classroom teaching performances.

Classroom Action Study I

For the study, my teacher candidate and I decided to focus on multiplication word problems in third-grade mathematics. Based on our assessments, we both agreed that the unit in mathematics would be a good one to improve pupil performance and achievement. In the past, pupils have had difficulty in solving multi-step multiplication word problems. Lessons on the topic usually needed to be re-taught. Oftentimes, when pupils were given problems to solve, many of the youngsters had difficulty in knowing when to use the associative property of multiplication and when to use the distributed property. We thought that if we focused on implementing differentiated instruction, while emphasizing the different modes of learning (e.g., auditory, tactile, visual), then those teaching moves would increase pupil engagement and subsequently increase pupil performance scores and their abilities to solve multi-step multiplication word problems. We also used peer tutoring as an instructional tactic for having pupils become more involved and engaged during a lesson.

Our goal, as outlined in the three research-inquiry questions previously cited, was to change and improve classroom teaching directed at favorably impacting pupil learning and achievement. The principal investigator and professor of the course asked us to place the first research-inquiry question in the context of the Instructional Domains of two teaching frameworks and rubric systems approved by NYS. The first teaching framework was the Charlotte *Danielson's Framework for Teaching Evaluation Instrument* (Danielson, 2011), while the second was the *New York State United Teachers Revised Practice Rubrics* (NYSUT, 2012).

Based on the purpose of our study, and an examination of the teaching rubrics included in the systems, we targeted the following rubrics or instructional actions as areas to strengthen:

Danielson's Revised Teaching Framework (2011):

- Engaging Students in Learning (rubric 3c)
- Using Assessment in Instruction (3d)

NYSUT (2012):

- Engaging Students (1C)
- Questioning Technique (2B)
- Differentiating Instruction (4A)
- Using Formative Assessment (6A)
- Providing Feedback During and After Instruction (6B)

The Adapted Flanders Observational Category System of Interaction Analysis (Catelli, 2010b):

- Gives Corrective Feedback (category 2b)
- Accepts, Uses or Extends Ideas of Pupils (3)
- Pupil Talk-Response to Questions (8a)
- Pupil Engagement - Participating in a Task, Activity or a Discussion Group (8b)
- Observation – Teacher Observing Pupils (10b)
- Teacher Talks and Pupil Illustrates and/or Demonstrates (12)

An Action Plan for the Study

My teacher candidate and I designed and implemented a plan for conducting the study. First, we taught a lesson on word problems in mathematics using didactic teaching. After the lesson, we gave a pre-test and then examined the data and pupil grades to determine areas of weakness. We identified multi-step multiplication problem solving. Next, and based on our analysis of the more frequently occurring errors, we designed three lessons for a mini unit. The mini unit was designed to revisit the concepts and skill areas for solving two-to-four step multiplication word problems in elementary mathematics. Based on our analyses of all the data we had collected, we created performance objectives and progressive learning tasks for each of the three lessons. The performance objectives, tasks, and materials were tailored to meet the varying learning needs of the pupils. The ultimate objective was to have pupils solve multi-step word problems identifying when to use the associative property of multiplication and/or the distributed property of multiplication. We employed differentiated learning for our auditory, tactile, and visual learners. Pupils were arranged in one of three groupings: (1) remedial, (2) average, and (3) above average. We gave exit tickets for pupils to complete after each of the three, 45-minute lessons. Also, we video-recorded each of the three lessons.

Collection and Analysis of Classroom Data

We used *The Adapted Flanders Category System of Interaction Analysis* (Catelli, 2010b) to collect and analyze the video data on classroom teaching. That observational system captures both teacher and pupil behavioral actions and interactions. We coded the video recordings and then analyzed the data quantitatively. The resulting data provided us with the frequency of occurrence of an instructional action, and the percentage of time we devoted to an instructional act included in the system (e.g., asking questions; giving corrective feedback, etc.). That approach to analyzing classroom video data told us “how time was spent” during a lesson. In addition, we assessed the teaching performances of the lessons seen on the video-recordings using an adjusted rubric-rating scale for the two rubric systems. The ratings on the adjusted scale ranged from 1.0 and 1.5 (low) to 3.5 to 4.0 (high). We then computed mean performance scores or ratings. The resulting mean scores told us “how well” the teacher performed each instructional act (or teaching rubric) for each lesson. We call that our qualitative approach to analyzing data. Each lesson was analyzed quantitatively and qualitatively. The quantitative-qualitative approach to analyzing video-recorded classroom teaching of lessons was developed by Catelli (2010b). The approach was used in most of our PDS action research studies for over the 16 years of the partnership. In addition to examining the video data after each lesson, we also examined the results from the exit tickets, the worksheets the pupils had completed during the lesson, and the homework assignments they had handed in to us.

Sample Data and Findings of the Study

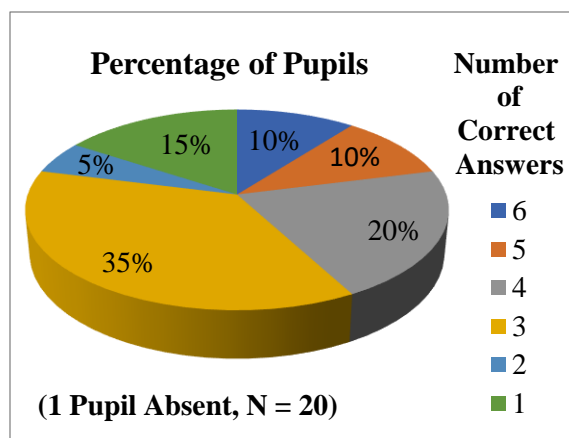


Figure 1. Percentage of pupils with correct answers to questions on the exit ticket after lesson 1.

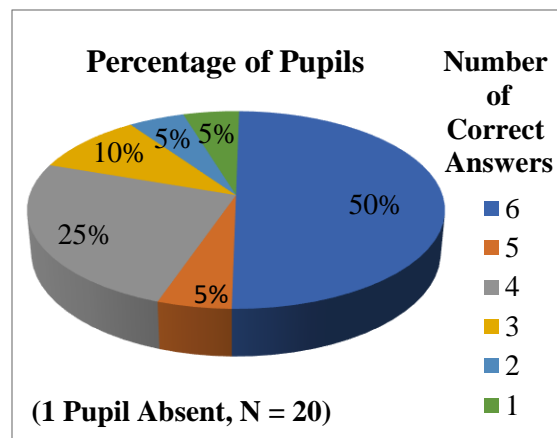


Figure 2. Percentage of pupils with correct answers to questions on the exit ticket after lesson 3.

Presented in Figures 1 and 2 are the percentages of pupils who answered the number of questions correctly on the exit tickets, for the initial lesson and for the third lesson. As you will note, the percentage of pupils answering all six questions correctly after the initial lesson was 10%, and after the third lesson 50%, an increase of 40%. That is, there were only two children who had

answered all of the questions correctly on the initial exit ticket, and 10 children who answered all of the questions correctly on the third exit ticket.

Seen in Table 1 is a comparison of the pre-and post-test numerical grades for each of the 21 pupils, along with the number of grade points that had increased for each pupil. Based on our examination of the pre-and post-test grades and other data, we found that:

- Each and all of the pupils (N = 21) increased their numerical grade and their ability to solve multi-step multiplication word problems.
- The increases in grade points ranged from five points (e.g., 85% to 90%) to 33 points (e.g., 46% to 79%).
- Six pupils had failing grades (below 65%) for the pre-test, while only two pupils received failing grades (55% and 60%) for the post-test.

Based on our comparisons and an analysis of all the pupil data, we concluded that all of the pupils (N = 21) increased their performance scores and their ability to solve multi-step multiplication word problems; and by the end of the mini unit, 19 of the 21 pupils met the minimum level of competency which was set at a grade of 65.

Table 1. Pre-and Post-Test Grade Results and Increases in Grade Points for Each Pupil

Pupil	1	2	3	4	5	6	7	8	9	10
Pretest	80	88	89	61	25	46	45	67	56	81
Post-test	96	100	100	78	55	79	60	81	79	95
Points Increased	16	12	11	17	30	33	15	14	23	14

Table 1 Continued

Pupil	11	12	13	14	15	16	17	18	19	20	21
Pre-test	77	78	68	55	69	72	45	91	85	78	91
Post-test	90	88	81	65	84	88	65	97	90	91	100
Points Increased	13	10	13	10	15	16	20	6	5	13	9

Regarding the classroom data that we collected from the video-recordings, shown in Table 2 is a comparison of the percentage of time that was devoted to each of the targeted instructional actions for the initial and final lessons:

Table 2. Percentage of Time Devoted to Targeted Instructional Actions

Instructional Actions	Initial Lesson	Final Lesson
Gives Corrective Feedback (category 2b)	10%	12%
Accepts, Uses, Extends Ideas of Pupils (3)	8%	10%
Pupil Talk-Response to Questions (8a)	11%	10%
Pupil Engagement -- Participating in a Task, Activity, or in a Discussion Group (8b)	7%	15%
Observes – Teacher Observing (10b)	15%	15%
Teacher Talks and Pupil Illustrates and/or Demonstrates (12)	9%	9%

Note. Percentage of time for the targeted instructional actions of *The Adapted Flanders Observational Category System of Interaction Analysis* (Catelli, 2010b).

By the third and final lesson you will note that “pupil engagement” increased substantially (7% to 15%). Were pupils more actively engaged by the third lesson? Based on the data and our observations, the answer is yes, absolutely! Do we think that an increase in “pupil engagement” was attributed to progressively implementing differentiated instruction and peer tutoring tactics? The answer again is yes. Do we think that the increase in pupil engagement favorably impacted pupil achievement of the objectives and their performance scores? Yes, we do believe that to be the case, especially so after we had analyzed all of the teacher and pupil data we had collected. Also, we should mention that there were other instructional actions that increased in terms of the percentage of time we devoted to them during a lesson. For example, the acts of “giving corrective feedback,” and “accepts, uses or extends ideas of pupils” were both increased. Such instructional actions are particular to implementing differentiated instructions. We believe that these actions, as well as “teacher asking questions” and “pupils responding to questions” also contributed to pupil achievement.

At the end of the third lesson, we computed a mean performance score for each of the instructional actions that we had targeted from the *Danielson* (2011) and *NYSUT* (2012) rubric systems. The resulting mean performance scores or ratings, seen in Tables 3 and 4, provided us with information about “how well” the teacher candidate performed the targeted instructional actions (or rubrics) that are associated with differentiated instruction.

Table 3. Targeted Instructional Actions from Domain 3 of *Danielson's Teaching Evaluation Instrument and System* (2011)

Instructional Actions	Mean Scores
3b. Questioning/Discussion Techniques	2.5
3c. Engaging Students	3.0
3d. Using Assessment in Instruction	3.0
Overall Mean Performance Score	2.8

Note. Mean scores (or ratings) for the targeted instructional actions of the Danielson System (2011) performed by the teacher candidate for lessons using differentiated instruction. The adjusted rating scale ranged from 1.0 and 1.5 (low) to 3.5 to 4.0 (high).

Subsequently, we used the same procedure for the *NYSUT* System (2012), as seen in Table 4:

Table 4. Targeted Instructional Actions from the *NYSUT* System (2012)

Instructional Actions	Mean Scores
2B. Uses Questioning Techniques	3.0
1C. Engaging Students	3.0
4A. Differentiates Instruction	3.0
6A. Uses Formative Assessment	3.0
6B. Provided Feedback	3.0
Overall Mean Performance Score	3.0

Note. Mean scores (or ratings) for the targeted instructional actions of the *NYSUT* System (2012) performed by the teacher candidate for lessons using differentiated instruction. The adjusted rating scale ranged from 1.0 and 1.5 (low) to 3.5 to 4.0 (high).

In both systems, the mean scores obtained equate to “effective,” and “proficient” performances. My teacher candidate did mention to me that studying the narratives for the rubrics, and incorporating them in her detailed lesson plans, were extremely helpful tactics for implementing the instructional actions during lessons.

Based on our final examination of all the teacher and pupil data, my teacher candidate and I believed that we did make “positive instructional change” happen in our classroom, and we did “favorably impact” pupil learning and achievement. And finally, we feel comfortable in saying that our classroom teaching, directed at pupil learning, was strengthened through this process. The classroom action research study helped us to solve an instructional problem and make change and improvement occur in our classroom in a more systematic way!

Classroom Action Study II

For this action study, I collaborated with a colleague, who teaches a fourth-grade class, and my teacher candidate. My teacher candidate was assigned to my classroom for one full semester prior to the study. All of us were members of Action Team 2 of the *CLIPS*, grant-funded project. My colleague and I are general education teachers at the Belmont Elementary PDS. Each of us has 25 pupils registered in our class. Within the context of the research-inquiry questions previously mentioned, the purpose of our study was to enhance the quality of our pupils' writing of an explanatory paragraph on simple machines by engaging them in the editing and assessment

process. In essence, we wanted to transfer the editing and assessment process to the pupils in our classrooms. Also, we wanted to identify the effects of that action.

Identification of the Problem

After having analyzed past writings of explanatory paragraphs on simple machines by our pupils, and after many discussions, we all agreed that the samples of writings we had reviewed were basic and lacked higher levels or ratings of quality. Also, we felt that our pupils were not taking responsibility for editing their own writing. We concluded that it would be important to improve pupil learning and achievement in this area by having them edit and assess their own work. We wanted our pupils to become more aware of the editing and assessment process and begin to monitor their own progress, as well as the progress and work of others.

Also, we wanted to see if they could independently, and with a partner, accurately score their explanatory paragraphs on simple machines. We were curious to know whether their new role in the process would in fact enhance the quality of their writing. Our goal was to have pupils achieve either a 3 or 4 rating using a writing rubric that they created as a fourth-grade group. In addition, we decided that our role in this unit would be that of a facilitator rather than a director of learning. We were partially influenced by the readings on effective teaching we had completed during the *CLIPS* models of teaching and learning class (see for examples Catelli, et al., 2009; Darling-Hammond, 2013; and Frey, 2010). Also, we knew that if we were to be successful we needed to plan and provide for more timely and specific feedback to pupils.

Area of Instructional Focus

Our area of focus was assessment and more specifically the *Danielson* (2011) rubric narratives for the instructional acts of “engaging students in learning” and “using assessment in instruction” (pp. 34-38). Both of these instructional actions coupled with the category of “engaging pupils” from *The Adapted Flanders Observational Category System of Interaction Analysis* (Catelli, 2010b) became the working framework for our observations and action study (pp. 109-111).

Action Plan

As a team of instructors for the unit, we first created a pre-and posttest on simple machines. Next, we designed performance objectives, lesson plans, and four power-point presentations for conveying information on each simple machine. Our intent was to have all of the fourth-grade pupils acquire the content and material in the same way. We also made sure to include exit tickets, and an adaptation of a pupil survey (see Rafal-Baer, Jablonski, & Vu, 2013 for the original pupil survey). We planned to give the survey after the fourth writing assignment. We further developed each lesson by including specific plans for progressively shifting the editing and assessment process to the pupils and emphasizing the teaching actions we had targeted. Also, we made plans to video-record the first and fourth lesson of the mini unit.

Implementation

By the second lesson of the unit, we had our pupils brainstorm and develop a writing rubric that they would then use to rate drafts of their explanatory paragraphs on simple machines. Pupils were arranged in groups of four. There were two pupils from class 4A and two pupils from my colleague's class, 4B. We wanted to ensure that everyone was working on the same page. Pupils worked together challenging one another to be creative and honest. We facilitated their discussions on the final wording of the "writing rubric." By the end of the group activity, all of the pupils were in agreement on the final rubric. They expressed that they now had a better understanding of the expectations for writing their simple-machine explanatory paragraphs. By the third and fourth lessons, pupils were using the rubric they had created. They used the rubric to edit and assess their own explanatory paragraphs and that of their partners.

Collection and Analysis of Classroom Data

For our action study, we collected data regarding (a) pupil classroom performances, and their rubric-writing ratings, (b) pre-and posttest knowledge of simple machines, (c) pupil feedback from exit tickets, (d) pupil perceptions from a final survey, and (e) teacher-rubric ratings, and the percentages of time we, as their teachers, devoted to the targeted instructional actions. We used the following observational tools to collect and analyze the video data:

- *Framework for Teaching Evaluation Instrument* (Danielson, 2011)
- *NYSUT's Teacher Revised Practice Rubric* (2012)
- *The Adapted Flanders Observational Category System of Interaction Analysis* (Catelli, 2010b)

We arranged for each of us to separately code and rate the video-recorded teaching performances of lessons so as to ensure reasonable reliability. For example, in using *The Adapted Flanders Observational Category System of Interactional Analysis* (Catelli, 2010b), my colleague and my teacher candidate each coded their own performance of lessons, and I coded each of their lessons. We aimed for at least 75% reliability -- matches of codes and ratings.

Sample Data and Summary of Findings

The data we obtained from using *The Adapted Flanders Observational Category System of Interactional Analysis* (Catelli, 2010b), in both classes, revealed that "pupil engagement" increased from the first lesson to the fourth lesson. My teacher candidate had a substantial increase in the time she devoted to that instructional action (49%). Table 5 lists the mean scores or rubric ratings for teacher performances of the targeted acts of "engaging pupils in learning," and "using assessment in instruction." Each increased from the first lesson to the fourth lesson.

Table 5. Teacher Performances of Targeted Acts

Teachers and Associated Acts	Lesson 1	Lesson 4
Engaging Pupils in Learning		
Teacher of Class 4A	3.5	4.0
Teacher of Class 4B	3.0	3.5
Teacher Candidate	2.5	3.0
Using Assessment in Instruction		
Teacher of class 4A	3.0	3.5
Teacher of class 4B	3.0	3.5
Teacher Candidate	2.0	3.0

Note. Targeted acts according to the *Framework for Teaching Evaluation Instrument* (Danielson, 2011). The rating scale ranged from 1.0 and 1.5 (low) to 3.5 to 4.0 (high):

In comparing the scores that the pupils received from the pre-and posttest on simple machines we found that:

- For Class 4A (n = 23), 18 pupils increased their numerical score, 2 pupils received the same score for the pre-and posttest, 2 pupils were absent for the posttest, and 1 pupil had no score recorded for either the pre- or posttest.
- For Class 4B (n = 21), 20 pupils increased their numerical score from the pre- to post-test, and 1 pupil had only a score from the posttest.
- Of the 43 pupils who took either one or both tests, 38 (or 88%) increased their knowledge of simple machines

The “writing rubric” that was created by the fourth-grade pupils, as a group, is seen in Table 6. The pupils used the rubric to edit and assess their writings of explanatory paragraphs, and that of their partners. In comparing the ratings for their initial piece of writing and their final writing of a paragraph on a simple machine, we found that:

- For Class 4A (n = 24), 2 pupils increased their rating, 17 pupils received the same rating, and 5 pupils were assessed at a lower rating.
- For Class 4B (n = 25), 11 pupils increased their rating, 9 received the same rating, 3 pupils were absent for completing the final piece of writing, and 2 pupils had no recorded data.

We decided to implement four additional lessons for Class 4A. My teacher candidate taught the four lessons. After the fourth additional lesson, we found that 9 pupils increased their rating from their last piece of writing, and 8 received the same rating. We were beginning to recognize how difficult it is to increase a rating or score in a short period of time. Also, we were somewhat surprised that pupils were close to or had matched perfectly with the ratings we had given them. For the most part, their ratings for their explanatory paragraphs, and that of others, were accurate.

Of the 43 pupils who took the ten-question perception survey, 18 pupils responded that they “felt comfortable self-editing their writing,” 19 pupils “felt somewhat comfortable,” and 6 “did not feel comfortable” at all. Thirty pupils said they “felt comfortable with partner editing,” and 10 pupils “felt somewhat comfortable,” and 3 “did not feel comfortable” at all. In response to the statement, “the rubric helps me make my writing stronger,” 30 pupils agreed with the statement, 8 somewhat agreed, and 5 disagreed with the statement.

Table 6. Writing Rubric Created by Fourth-Grade Pupils

Criteria	4 Exceeds Expectations	3 Meets Expectations	2 Approaches Expectations	1 Not Yet
Structure of Paragraph (How it is set up and organized)	<ul style="list-style-type: none"> • Strong topic sentence • Lots of specific details • Strong closing sentence 	<ul style="list-style-type: none"> • Good topic sentence • Three specific details • Good closing sentence 	<ul style="list-style-type: none"> • Weak topic sentence • Few details • Weak closing sentence 	<ul style="list-style-type: none"> • No topic sentence • No details/details are incorrect • Closing sentence doesn't restate the topic/no closing sentence
Content (Information)	<ul style="list-style-type: none"> • Specifically states the name of the simple machine and tells what it does, describes it, tells how it makes life easier, and gives examples 	<ul style="list-style-type: none"> • States the name of the simple machine and tells: what it does, how to make life easier, and gives examples 	<ul style="list-style-type: none"> • Missing 2-3 of the following details: • Name of the simple machine, what it does, describes it, tells how it makes life easier, and gives examples 	<ul style="list-style-type: none"> • Missing 4 or more of the following details: the name of the simple machine, what it does, describes it, tells how it makes life easier, and gives examples
Grammar/ Mechanics	<ul style="list-style-type: none"> • Writes very neatly • Spells all words correctly • Has strong linking verbs, phrase, and vocabulary • Has correct punctuation and capitalization 	<ul style="list-style-type: none"> • Writes neatly • Has some spelling errors • Has some linking verbs and phrase, and good vocabulary • Has some correct punctuation and capitalization 	<ul style="list-style-type: none"> • Needs more research • Writes some complete sentences • Writes sloppy • Missing linking verbs, phrases, and vocabulary/weak vocabulary • Does not use correct punctuation and capitalization 	<ul style="list-style-type: none"> • Doesn't stay on topic • Has inaccurate information • Writes very sloppy • Makes many spelling errors • Makes many punctuation and capitalization errors • Include many incomplete sentences

Information obtained from the exit tickets and feedback from pupils revealed that pupils liked having a rubric. They commented that with the rubric, and having created it, they knew exactly what was expected of them to get a rating of 4 on their written paragraphs. In my class, many pupils did not receive a rating of 4 on their final piece of writing on a simple machine. In fact, I saw little or no gains. My teacher candidate and I did notice, however, that pupils' confidence in their writing had changed for the better. We also noted stronger writing pieces that consisted of better sentence structure, punctuation, and an improved description of the topic. Pupils who had previously struggled with their writing were now engaged and wanting to write on a daily basis. That certainly signaled to us a significant change from previous attitudes. Through numerous private conversations with my pupils on their writing, many mentioned to me that when they wrote a paragraph they were striving to achieve a rating of 4. In my colleague's classroom, she noticed that a few of the pupils commented that the use of the rubric negatively affected their confidence in writing. She then went back and addressed the situation with those individual pupils to determine the reasons why they felt that way.

After examining all of the data, we concluded that we did see positive change occur in the instructional actions we had targeted, and we did impact learning favorably by shifting the editing and assessment process to pupils. Did pupils enhance the quality of their writing of explanatory paragraphs? We believe so. Now, pupils are taking more of an interest in their writing. Through this action study, we seemed to have established a better atmosphere and culture for learning. Pupils have more respect for one another; they are more willing to help their classmates with the writing and editing process, and that's a good thing.

Final Comment

Both of these classroom studies are excellent examples of collaborative, PDS action research for change and improvement. Each study demonstrates quite nicely the instructional and research linkages to improve pupil-and-teacher achievement. Also, each study promotes, rather successfully, the holistic integration of the four-pronged PDS model: preparation of pre-service teachers; professional development of in-service teachers; improved pupil learning and achievement; and the implementation of innovative inquiry and/or research designed to maximize learning and achievement at both the school and university levels.

Lastly, in this new chapter of the PDS movement, we as PDS leaders should be emphasizing PDS action research and classroom inquiry in our agendas for improving learning and educational practice. Also, we should be advancing PDS action research as a means for strengthening education and the American education workforce. The preparation and recognition of PDS teachers as teacher-leader innovators, researchers, and teacher educators is crucial to moving the PDS model forward. If we are to flourish during these years of federal and local change, we need to make sure that our research and classroom inquiry is precise, productive, and apparent in our partnerships, and in our networks for change, improvement and innovation.

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²An explanation of the CLIPS grant project and the new career ladder for teachers and one for principals may be found in an unpublished document by Marino, Catelli, Ristea, and Godek, produced in 2013.

³For an explanation and examples of PDS action research see Tunks, 2011; Catelli, 2011; Catelli, Carlino, and Petraglia, 2014; and Catelli, Carlino, Petraglia, Godek, and Jackson, 2016. For a description of action research and collaborative inquiry in partnership settings see Catelli, 1995; and Catelli, Padovano, and Costello, 2000.

⁴ For a complete explanation of the approach, theory and practice of holistic partnerships see Catelli, 1992, 1997, 2002, 2010a, 2011, and Catelli, Jackson, Marino and Perry, 2014.

⁵See Catelli, Carlino, Petraglia, Calascibetta, Jackson, and Marino (2017) for data generated by the 29 CLIPS classroom studies; and see Van Cott (2015) and Catelli, Marino, and Eschbach (2017) for the impacts and findings of the CLIPS grant-funded project.

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