

6-29-2015

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Recommended Citation

Pennington, Sarah E. (2015) "Inquiry Into Teaching: Using Reflective Teaching to Improve My Practice," *Networks: An Online Journal for Teacher Research*: Vol. 17: Iss. 1. <https://doi.org/10.4148/2470-6353.1036>

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An On-line Journal
for Teacher Research

Inquiry Into Teaching: Using Reflective Teaching to Improve My Practice

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Abstract

How effective is reflective teaching in increasing the engagement and achievement of pre-service teachers when utilized by a first-year college instructor? This article documents a practitioner inquiry project in which I reflected both on my own observations and student feedback regarding what teaching methods were most beneficial in an undergraduate elementary education class. Data included student feedback, personal researcher journal entries, student quiz scores, and format for presenting material in class. Pre-service teacher engagement and learning were both enhanced by integration of videos, activities, and higher level questions into class sessions. The results of this research affirm the power of reflective teaching while also reflecting the need to more actively engage pre-service teachers in this practice.

As a new instructor at the college level, I came in with preconceived notions based on my own previous experiences of what teaching undergraduate students looks like. These prior experiences included a great deal of lecture, independent work, and whole class discussion of the material within each class session. However, as a reflective practitioner, I pushed myself to question those notions and search for more effective methods and strategies. This perspective of the reflective practitioner aligns with Dewey's (1904) statement that one who truly wishes to "grow as a teacher" must be a "student of teaching" (p. 791), reflecting on their own practice and continuing to seek for and learn as much as possible about pedagogy, content, the needs of their students, etc. I sought to analyze my own teaching, determine its effectiveness, and actively engage in improving my strategies to benefit my students.

The idea of basing current teaching behavior on the behavior of one's previous teachers is written about extensively in the literature and is described as the apprenticeship of

observation. Lortie's (1975) notion of "apprenticeship of observation" (p. 61) has been regularly cited in studies of teaching and teacher education across subject areas. A most often quoted remark is that the average pre-service teacher has spent 13,000 hours in direct contact with classroom teachers by the time he or she graduates from high school. This catchphrase is echoed by Heaton and Mickelson's (2002) claim that "teachers teach the way they were taught" (p. 51). This concept seeks to explain why there may be a lack of influence of teacher education programs on shifting or challenging pre-service teachers' existing beliefs and practices. This concept also suggests that doctoral students who are given teaching assignments may draw on the apprenticeship of observation from their own teacher preparation when teaching pre-service teachers. Without disrupting prior views of what it means to prepare and teach prospective teachers, doctoral students will likely not engage in reform or innovation in course content and delivery. This lack of innovation is then passed on to the pre-

service teachers who continue teaching students using the same strategies and approaches they have experienced themselves, regardless of how effective or ineffective these strategies may be.

Equally important was my interest in teacher reflection. By putting the idea of reflective practice into action, “teachers play a vital role in enhancing their own professional growth and, ultimately, the experience of schooling” (Dana & Yendol-Hoppey, 2009, pp. 7-8). I feel that this statement holds true at every level of education, but is especially pertinent for teacher educators to consider as their practices serve as a model for the pre-service teachers under their guidance. In the main textbook for the course Reading and Learning to Read, one of the first points made to the reader is that “excellent teachers...teach these skills explicitly – often through modeling and demonstration” (Cunningham & Allington, 2011, p. 9). As a teacher educator, I must also keep this in mind with the pre-service teachers who are my students, modeling the skills and strategies I wish them to use and internalize.

The third item informing my inquiry was my belief in student participation in assisting me at becoming the best teacher I can be. As a part of assuring that my reflection was systematic and intentional, in this inquiry I relied on pre-service teachers’ feedback as a source of data for my inquiry. I agree with McIntyre, Pedder, and Rudduck (2005), who based their work around two premises: all students have a right to be consulted about their education and have their ideas considered and that consulting students about methods and learning is important to help schools and teachers improve their practice. In teaching pre-service teachers, I feel it is important to not only model strategies and methods for teaching content knowledge, but also serve as a model for building a reflective stance in one’s own practice and on recognizing the needs of one’s students, showing the pre-service teachers “the pedagogic...value that ‘listening to learners’ brings” (Kidd, 2012, p. 20). In

asking for and acting upon feedback from the pre-service teachers in my class, I was able to accomplish those aims. In sum, I found my inquiry emerged at the intersection of my own apprenticeship of observations, the role of reflection, and the integration of student feedback into my on-going inquiry into my teaching. The purpose of this inquiry is to determine how systematically and intentionally reflecting on my own strategies and methods of teaching Reading & Learning to Read influenced the pre-service teachers’ engagement and achievement in class. Students who are engaged are involved in learning at a deeper level, as opposed to the unengaged student, who will “take a ‘surface’ approach to learning” (Hocking, Cooke, Yamashita, McGinty, & Bowl, 2008). Within this study, I gauged achievement through pre-service teacher quiz scores. Engagement was defined as being actively involved in class discussions and other activities.

Method

This study is situated within the teacher research paradigm, defined as “systematic, intentional inquiry by teachers about their own...classroom work” (Lytle & Cochran-Smith, 1993, pp. 23-24) and was designed to inform my own practice and enhance pre-service teacher learning. In particular, this study fits within the broad category of teacher empirical research, involving the collection of data about my own classroom practices, which I then analyzed and interpreted (Lytle & Cochran-Smith, 1993). The goal of this study, within the realm of teacher research, was to gain insight into my own practice in order to make changes to benefit my students (Dana & Yendol-Hoppey, 2009). The research question driving my study was, “In what ways do the changes I make in teaching Reading and Learning to Read Course, based on student feedback and my own observations/reflections, influence pre-service teachers’ engagement and achievement within the class?”

Context

This particular semester, my first as a teacher of pre-service teachers, I taught two sections of Reading & Learning to Read at a research university on the Gulf Coast of Florida. This class is intended to teach pre-service teachers about the process of learning to read, the various foundational pillars of literacy including phonemic awareness, phonics, comprehension, fluency, and vocabulary, as well as strategies and methods for teaching these skills to diverse populations of students in an elementary setting. Students complete assignments that include the use of Running Records to gauge student growth and pinpoint areas of concern in reading, the creation of lesson plans that integrate literacy into various content areas, and analysis of lessons and activities built around the pillars of literacy.

During the first class meeting in August, much of the class session for both sections was spent with me at the front of the room presenting information to the class utilizing a PowerPoint. I began by asking students to introduce themselves, moved on to an overview of the syllabus, and then brought in our first reading of the semester. Students read the article in small groups and worked in those groups to create a graphic that reflected their understanding of the article. There was little discussion as students read and created their group visual, and as I had groups share their finished product, there was little conversation, as everyone's visual was essentially the same. Class continued with a short video for the students to watch, identifying various elements of literacy education within the video. Again, there was little discussion, as the questions asked were basic questions asking students to identify what they saw, with no further thought required. Although the students left class smiling and commenting that they were looking forward to the rest of the semester, I felt unsatisfied.

The students in both sections of this class were all juniors in college and members of a cohort in elementary education. There were

nineteen students in one section (14 Caucasian, 3 Hispanic, 1 Asian, and 1 African American) and twenty-seven in the second section (16 Caucasian, 9 Hispanic, and 2 African American). Within these two class sections, five students identified themselves as having been English Language Learners at some point during their K-12 education, with Spanish being the first language for all five. Students in both sections ranged in age from early 20s to early 40s. There were two males in each section of the class. The cohort model, then in its first year at this university, allows students to move through the program with a consistent group of peers and work within the same collaborating school for the majority of their internship experiences.

Data Collection

Within this class, a great deal of naturally occurring student data was available to the instructor and this data was used to inform my inquiry. For example, within the course pre-service teachers' achievement was gauged through in-class quizzes on the material covered. In these quizzes, students were asked to apply the material that had been taught to hypothetical teaching situations. Thus, achievement was based not on solely being able to repeat what was learned in class, but to apply it to actual teaching situations that pre-service teachers may encounter as they move through the levels of their internship experience and into their own classrooms. Engagement, which I defined as being actively involved in class discussions and other activities, was gauged both through pre-service teacher feedback and through my observations of the pre-service teachers during each class session. I kept a legal pad nearby during class sessions and noted activities, questions, and strategies that had high levels of active pre-service teacher participation, reflecting on these notes in my journal each week.

Pre-service teachers' feedback was collected through in-class discussions, informal in-class surveys, and one-on-one conversations with students. I began collecting feedback from the

pre-service teachers in my class during the fourth week of class, and began modifying my teaching based on the on-going analysis of that feedback the following week. This cycle of analysis using feedback and other data gathered from pre-service teachers continued for the remainder of the semester.

I also kept a research journal, in which I wrote weekly, to record my own observations and reflections on what was working within the class and what changes I felt would benefit the students based on my reflections of the class itself and reflection on the feedback I received from the pre-service teachers. I made it a habit to write in the journal after the Thursday class session, as this allowed me to reflect on the feedback I received as well as on the changes I made to the Thursday session based on the feedback from the Monday session. In addition to these sources of data, I had the opportunity to observe a more experienced instructor who teaches a different class in order to see another view of teaching at the college level.

In order to better gauge my own growth as an instructor, I also collected data from the in-class presentations that I used in class. These presentations were used within each class session as an outline of the information to share, questions to be discussed, and activities for the pre-service teachers to take part in during that class meeting. I gathered data about the number of videos and activities integrated into each week's presentation as well as the level of questioning I was engaging the pre-service teachers in within each week's presentation.

Data Analysis

I analyzed the student feedback data and my own notes and journal entries by looking for repeated words and phrases in these sources, highlighting words and phrases in the sources to identify repetition throughout data sources, and similarities and differences between sources (Ryan & Bernard, 2003). This analysis led to themes that I used for coding the data, including "use of modeling/

examples," "hands-on activities & practice," "application," and "pace."

In reviewing my journal, certain themes emerged in the changes I made to Reading and Learning to Read. The first theme that I noted regarded the use of a variety of activities within the class, as in this excerpt from my second journal entry:

I finally got to teach my first face-to-face class of undergrads this morning (Thursday) and it went really well. I asked them to fill out an exit ticket with comments, questions, etc. and got some very good feedback. Among the high points, students commented:

"Interactive & cooperative assignments," "Sample project and practice grading with the rubric," "Good pacing," and "Different methods/strategies used to teach." I am relieved that there are already positive aspects to the methods I am using in class, and I will need to build on this strength to keep the class on track.

Based on this feedback, I evaluated my plans for class sessions, focusing on purposeful use of activities and videos. I talked to other instructors in the department and read through practitioner publications to add a variety of strategies and tools that I could integrate into my classes.

This theme, the use of a variety of activities, remained evident throughout my reflections on the workings of the class and on the feedback I received from pre-service teachers. In the seventh week of class, I commented in my journal:

On another note,...feedback continues to be positive when it comes to the use of videos and interactive activities in class. I've also noticed that the pre-service teachers appear more engaged when doing the activities, offering more comments and discussing the activities more with their classmates and me.

Another theme that emerged as I analyzed my data was the need to increase the level of the questions being posed to the pre-service teachers in the class. Although the pre-service teachers were gaining a good understanding of the material taught in class, as shown through increasing quiz scores and in-class discussions, I wanted to ensure that they understood why the material was important, how to apply this material into classroom situations and how to modify the ideas and strategies being presented to meet the needs of various students. I had already noted the increased level of discussion the pre-service teachers engaged in when given hands-on activities to complete and videos to view, and commented in my journal that I felt I needed to “build on this strength to better prepare the pre-service teachers to put their new knowledge into action.”

In the seventh week of the semester, I began focusing more on the questions I planned to pose to the pre-service teachers in my class sessions. I realized that, although the quizzes I prepared for the class consisted predominantly of higher level questions, the questions I posed in class tended toward basic knowledge questions. With a copy of Bloom’s Taxonomy that I had used as a middle school teacher, I evaluated the questions I had previously created, removed some of the lower level questions, and added at least one to two higher level questions that would push the pre-service teachers to take their new knowledge and apply it to their own practice. This included evaluating curriculum materials and discussing how they could be modified to meet the needs of students of varying abilities and creating new activities to focus on various facets of literacy. My analysis and focus on integrating higher level questioning in each class session continued for the remainder of the semester.

Findings

A number of assertions emerged as I reviewed the data collected to answer my research question, “In what ways do the changes I

make in teaching an undergraduate Reading and Learning to Read Course, based on pre-service teachers’ feedback and my own observations/reflections, influence pre-service teachers engagement and achievement within the class?” These assertions suggested the power of video and hands-on activities as teaching tools and the importance of the instructor’s role in pushing students to engage in higher level thinking.

Assertion One: Pre-service teacher engagement and achievement was strengthened as I integrated videos and other activities to model methods and strategies.

Pre-service teacher engagement and achievement was strengthened as I integrated videos and other activities to model methods and strategies. For example, pre-service teachers in both class sections commented both on the videos integrated into the class presentations, which show the methods and strategies we have discussed that day being used in elementary classrooms, and on the other materials that I brought into class and modeled using with the pre-service teachers. Comments on the use of videos included:

I really like some of the videos we watch, it’s really nice to see techniques being implemented.

I like the videos we watch in class because they give me a lot of great ideas for when I become a teacher.

The pre-service teachers saw the videos as a valuable modeling tool which helped them to better visualize the strategies and methods we discussed in class as they are used in a classroom. This also gave them models of specific activities using the strategies, enabling the pre-service teachers to make real connections between theory and practice. Comments on the activities used within the class sessions showed similar themes in both sections of the class.

...the fact that you give us time to practice the techniques that you teach us is truly invaluable.

Table A. Comments about modeling and hands-on activities

Theme	Comments from Thursday section	Comments from Monday Section
Modeling/Examples	<p>“I really like some of the videos we watch, it’s really nice to see techniques being implemented.”</p> <p>“I like how you give us lots of examples and show us how we can use materials for when we become teachers.”</p>	<p>“I like that you...give us great examples/ideas...”</p> <p>“I like the videos we watch in class because they give me a lot of great ideas for when I become a teacher.”</p>
Hands-on Activities & Practice	<p>“Allowing us to actually work on the strategies in class helps. Not just talking about them, but doing them!”</p> <p>“...the fact that you give us time to practice the techniques that you teach us is truly invaluable.”</p> <p>“I enjoy doing the activities...”</p> <p>“I like being given resources and being able to practice with the resources and material.”</p> <p>“I like when we do hands on activities...gets us more engaged.”</p> <p>“I like that we actually perform the activities that we discuss in the lecture.”</p> <p>“...doing activities that actually put strategies to use, it makes me feel confident about using the strategy in the future.”</p> <p>“I appreciate the opportunity to practice strategies...”</p>	<p>“I love the fun activities we do because it’s preparing us and giving us an idea of what to do.”</p> <p>“I really like the activities we do. They get us thinking...”</p> <p>“I like how you give us a chance to practice the strategies we learn in class.”</p> <p>“The activities are fun and informative. I learn them better when I get to do it myself.”</p> <p>“I like the activities we do in class so that it is modeling prior to us doing it in our classroom.</p> <p>“Having experienced the activity makes it a lot easier to explain in a lesson.”</p>

...doing activities that actually put strategies to use, it makes me feel confident about using the strategy in the future.

The activities are fun and informative. I learn them better when I get to do it myself.

Less lecture, more activities!

Again, the activities used in class were seen as a valuable use of class time, as they allowed the pre-service teachers to make connections between theory and practice, using and

creating activities that could be utilized with students in an elementary classroom setting. For additional comments, see Table A, separated by class section to show the similarities between the comments made by both class sections.

In feedback at the end of the semester, the changes I made were also recognized by the pre-service teachers as positive and beneficial. When asked to respond to the prompt, “How has my teacher changed over the course of this semester? How have these changes

affected you and your learning?” I received responses such as:

At first a lot of the class was lecture by you but as time has gone by we have become more involved as a class.

...it was more visual and we were more involved at the end.

I have noticed that you are allowing us to become more independent in learning.

I had made similar comments throughout the semester in my researcher’s journal, having noted that the pre-service teachers seemed very engaged with the videos and activities given in class and that discussion following such examples showed a high level of understanding of the material. In one journal

entry, I noted:

The discussion after today’s video was one of the most animated in class thus far. Some of the pre-service teachers were even up out of their chairs, so emphatic were they about the points they wanted to share with the class. The discussion reflected many differing ideas about the strategies observed.

In order to get a better idea of my use of videos and activities within each class session, I also analyzed the mix of video and activities I had used for each class session (see Table B). The number of videos I used in each class session stayed fairly consistent, and there

Table B. Record of types of activities per week

Week	Videos	Activities (involving hands-on work and/or group discussion)	Higher Level Discussion Questions (Whole class and/or small group, independent of activities)
1	2	1	0
2	3	1	0
3	3	1	1
4	1	1	1
5	3	2	2
6	3	3	2
7	1	2	3
8	4	4	1
9	0	1	3
10	1	1	3
11	2	2	4
12-13	10	4	1
14	0	2 (5 stations=1 activity?)	2

were only two weeks in which videos were not utilized within class. There was, however, an increase in the number of activities that were utilized in each class session. In the first four weeks of class, there was only one activity per class session. I increased this in the following weeks, with two weeks during the rest of the semester in which only one activity was integrated into the lesson for that session. I also noticed as I looked over the presentations for the semester that I had succeeded in increasing the quality of the activities and discussion questions as the semester went on, pushing the pre-service teachers in my course toward higher level thinking, which I defined as being Bloom's (1956) taxonomy levels of application, analysis, synthesis, and evaluation. I will address this further in my next assertion.

Student feedback reflected a higher level of engagement in the class thanks to the increased integration of activities throughout the semester, a finding that was also reflected in my own notes and journal entries, but I was still unsure if student achievement had likewise increased. In looking at student achievement, I saw an increase in pre-service teacher quiz scores from the first quiz, which was taken at the beginning of the fifth course meeting (before any changes had been made in my teaching) and the second quiz, which the pre-service teachers completed in the ninth week of class. The class average for the two sections on the first quiz was 79.6%. On the second quiz, the average for both sections of the class jumped to 94%. Although I cannot claim that the increased engagement caused this increase in scores, it is clear that the changes I implemented did not have a negative effect on the achievement of the pre-service teachers.

Assertion Two: Pre-service teachers benefit by “pushing” their thinking about the video examples and sample activities presented during class.

Although the use of videos appeared to strengthen student understanding of the methods and strategies discussed in class, I

also reflected that I could use this engagement to push them further in their thinking, prompting them with higher level questions that would push them to connect the material from the videos to their own practice. For example, in week one I had shown a short video clip featuring highlights from a kindergarten class's literacy block. After viewing, I presented the students with this discussion prompt: “Did this teacher incorporate the “Fab Five” in her classroom? How?” This prompt does ask the pre-service teachers to use the information we have learned about and discussed in that class session, but it does not go any further than the most basic levels of Bloom's (1956) Taxonomy, remembering and understanding.

I saw a similar level of questioning as I continued reviewing the activities and questions I had posed to the pre-service teachers, with many of them asking the pre-service teachers to identify strategies and categorize activities within the five pillars of literacy. There was little application, analysis, synthesis, or evaluation within the questions being posed during class sessions.

Since the examples and videos were an area in which the pre-service teachers already showed a high level of engagement, I determined that this was an area I needed to strengthen and use to challenge the pre-service teachers more within each class session. I determined to engage the pre-service teachers in higher level thinking more consistently during class sessions when discussing video segments and engaging in other activities.

Once I had made this a priority in my teaching, the questions I posed to the pre-service teachers in my class became more focused on higher levels of Bloom's taxonomy, asking them to respond to more questions that began with “why,” and also asking the pre-service teachers to adapt and modify the ideas and examples presented. One example of this is in the discussion questions I posed to the pre-service teachers after viewing a video clip showing reading strategies in a

variety of K-2 classrooms during the ninth week of the semester. In addition to questioning the pre-service teachers about the strategies they saw used in the video clip (remembering and understanding), I also asked them to reflect on what they might have done differently (evaluating and applying), why the teachers in the video chose those particular strategies (analyzing and evaluating), and how the strategies they saw in use would need to be modified for higher grade levels (applying). In addressing these questions, pre-service teachers engaged in more of a discussion, exchanging and building upon the ideas of their classmates. This was different from previous experiences in class in which the pre-service teachers had responded to questions with answers straight from the material but had not engaged in any further discussion of the material or inserted their own thoughts into their responses.

Another example of the higher level questions I posed to the pre-service teachers was during a centers activity the last week of class, during which they experienced a number of centers that had been created for helping build vocabulary and comprehension skills. After rotating through the centers, the pre-service teachers were asked to choose one of the centers and modify it for a different grade level and to fit into a content area (science, social studies, mathematics) while still working with the same area of literacy (vocabulary or comprehension). This engaged students in applying information they had learned earlier in the semester to a new task to create an activity that integrated a hands-on approach to literacy into a content area of their choice. These changes also tied into an area of improvement that had been recommended by the pre-service teachers; integrating more activities that allowed them to transfer the material we were learning in class to “real life” classroom applications.

Discussion

In the process of this inquiry, I have reevaluated my preconceived notions about

teaching at the college level. Many of the changes I made, such as integrating more hands-on activities, modeling, and higher level questioning, are strategies that I had used regularly as a classroom teacher in a middle school. Looking back, I realize that although I need to adapt these strategies to meet the needs of this new level of student, the core of teaching is still very similar to my prior experience. The style of teaching that I found myself integrating into my new classroom environment is greatly different from my own experiences as a college undergraduate; indeed, the heavy lecture method that I originally brought in is a far cry from the mix of activities, discussions, and occasional lecture that now forms my current approach to teaching in the college classroom. In being reflective and responsive to my students, I discovered that the way I was taught is not necessarily the most effective way. This idea of being a reflective practitioner and inviting and responding to student feedback is one that could prove beneficial to others just beginning their journey into teaching at the college level.

Unlike my middle school students, whose suggestions often focused on reducing the workload in the classroom, the pre-service teachers in my undergraduate class made suggestions that focused the workload in ways that would better help them understand and apply the information they were learning. However, in working with both levels of student, an important point remained consistent: in order to help my students achieve success, I must model the strategies for them and give them opportunities to apply new knowledge to increase their understanding. “Do as I say, not as I do” is not a valid model for educating pre-service teachers. Evidence from this study reiterates the need for the teacher educator to actively embody the dispositions they want to see in the pre-service teachers they train, showing the power of the strategies and methods that work best by incorporating them into their own teaching. I will continue to use student feedback to guide my teaching in the semesters to come, as it has improved my

teaching as well as benefitting the pre-service teachers in my classes.

One of the unexpected benefits to my inquiry this semester is that the pre-service teachers had an opportunity to see me engage in reflective practice. I told them about my inquiry and encouraged their feedback throughout the semester. They, in turn, noticed that I was actually making changes based on that feedback, which encouraged them to continue offering their feedback as the semester continued. One of the pre-service teachers summarized this best:

As an intern I am told to reflect and to plan accordingly but it is rare that I actually see an in-practice teacher do so. I have learned in watching you that there is a real benefit in modifying lessons and I have noticed how doing so has changed your teaching style.

Next semester, as I will have the opportunity to both teach pre-service teachers and supervise them in their internship experience, I would like to inquire into my ability to instill an inquiry stance into their practice.

If the cultivation of this inquiry stance is to become a key outcome of my own practice, as well as our undergraduate teacher education program, I will need to make changes within my teaching as well as offer insights to our program development efforts. The response of the pre-service teachers to my inquiry process was positive and supports the strength of explicit modeling within the program. Being clear about my own inquiry, the reasons behind it, and my progress during the semester gave the pre-service teachers a view of the process in action and allowed them to see the power of reflective teaching from the perspective of a student. As the program continues to grow, including the pre-service teachers in discussions regarding ongoing practitioner inquiry that is taking place within the department is one way in which this modeling of an inquiry stance can be better integrated and supported.

One change that I feel will strengthen an inquiry stance within the pre-service teachers I teach is to guide them through the process of creating their own inquiry. This can easily be done through the observation and coaching process already in place within the internship aspect of the program. Post-observation conferences give the internship supervisor an opportunity to lead the pre-service teacher toward his/her own wonderings and create a plan to find answers to these questions. This process needs to be on-going in order to aid pre-service teachers in seeing inquiry not as an assignment, but “as a way of teaching that extends across the professional life span” (Cochran-Smith & Lytle, 1999, p. 17).

References

- Bloom B. S. (1956). *Taxonomy of educational objectives: Handbook I: The cognitive domain*. New York: David McKay Co Inc.
- Cochran-Smith, M. & Lytle, S.L. (1999). The teacher research movement: A decade later. *Educational Researcher*, 28(7), 15-25.
- Cunningham, P.M. & Allington, R.L. (2011) *Classrooms that work: They can all read and write*. New York: Pearson Education, Inc.
- Dana, N.F. & Yendol-Hoppey, D. (2009) *The reflective educator's guide to classroom research: Learning to teach and teaching to learn through practitioner inquiry*. Thousand Oaks, CA: Corwin Press.
- Dewey, J. (1904). The relation of theory to practice in education. In M. Cochran-Smith, S. Feiman-Nemser, D.J. McIntyre, & K. Demers (Eds.), *Handbook of research on teacher education: Enduring questions in changing contexts*, third edition (pp. 269-289). New York: Routledge.
- Heaton, R. and Mickelson, W. (2002) The learning and teaching of statistical

- investigation in teaching and teacher education. *Journal of Mathematics Teacher Education* 5(1), 35-59.
- Hockings, C., Cooke, S., Yamashita, H., McGinty, S., & Bowl, M. (2008). Switched off? A study of disengagement among computing students at two universities. *Research Papers in Education*, 23, 191-201.
- Kidd, W. (2012). Relational agency and pre-service trainee teachers: using student voice to frame teacher education pedagogy. *Management in Education*, 26(3), 120-129.
- Lytle, S. L., & Cochran-Smith, M. (1993). *Inside/outside: Teacher Research and Knowledge*. Ipswich, MA: Teachers College Press.
- Lortie, D. (1975) *Schoolteacher: A sociological study*, Chicago, IL, The University of Chicago Press.
- McIntyre, D., Pedder, D., & Rudduck, J. (2005). Pupil voices: comfortable and uncomfortable learnings for teachers. *Research Papers in Education*, 20(2), 149-168.
- Ryan, G.W. & Bernard, H.R. (2003). Techniques to identify themes. *Field Methods*, 15(1), 85-109.