

## Researching Problems of Practice in a Teacher Education Program

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### Abstract

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*Inspired by Cochran-Smith's and Lytle's understanding of teacher research and the notion of inquiry as a stance, this essay explores the transformation of an integrated research course sequence that was originally launched as a major component of the teacher education program at the School of Education of Quinnipiac University. In what follows, we first describe the creation of the original research course sequence, the revisions recently made to it as well as the main reasons driving us to make these revisions. We highlight the new emphasis in this sequence on researching problems of practice and how the teacher candidates in our program implemented the changes that were made. Drawing on two-years of data with the new version of the research course sequence, we use multiple data sources to assess both the outcomes of the course sequence and the process that our teacher candidates experienced. Finally, we briefly reflect on some conclusions and implications that emerged from the changes that we made to our research course sequence*

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**Keywords:** action research, problems of practice, teacher candidates, authentic

### Introduction

An increasing number of teacher preparation programs are choosing to include an emphasis on action research as an essential component of their curriculum while simultaneously adopting the model of the teacher-researcher as a central image of the work that happens in schools and classrooms (Wolkenhauer, Boynton & Dana, 2011). This new emphasis on the teacher-researcher model is informed in part by the realization among many educational researchers and classroom teachers that in order for teachers to successfully negotiate the daily challenges that arise in their classrooms, teachers need to acquire the knowledge and dispositions of a researcher (e.g. Ballenger, 2009; Burnaford, Fischer, & Hobson, 2001; Ravitch, 2014; Zeichner, 2003). For Cochran-Smith and Lytle (2009), this means that we should conceptualize teacher inquiry as a stance as opposed to viewing it in the narrower sense

of using some basic research skills to tackle a specific project or problem. The notion of inquiry as a stance is based on the assumption that good teaching is most likely to occur when “teachers treat their classrooms and schools as sites for intentional investigation at the same time that they treat the knowledge and theory produced by others as generative material for interrogation and interpretation” (Cochran-Smith and Lytle, 2001, p. 48). For teacher candidates, the notion of inquiry as a stance suggests that they could really benefit from having opportunities to work together with classroom teachers to investigate problems arising in classrooms, interpret knowledge produced by others, and theorize interventions to these problems based on the research evidence as well as their own experience.

Inspired by Cochran-Smith’s and Lytle’s understanding of teacher research and the notion of inquiry as a stance, this essay explores the transformation of an integrated research course sequence that was originally launched as a major component of the teacher education program at the School of Education of Quinnipiac University. In what follows, we first describe the creation of the original research course sequence, the revisions recently made to it as well as the main reasons driving us to make these revisions. We highlight the new emphasis in this sequence on researching problems of practice and how the teacher candidates in our program negotiated the process of investigating their own problems. Drawing on two-years of data with the new version of the research course sequence, we use multiple data sources to assess both the outcomes of the course sequence and the process that our teacher candidates experienced. Finally, we briefly reflect on some conclusions and implications that emerged from the changes we made to our research course sequence.

### ***A Revised Research Course Sequence***

In an article published in 2011, Mordechai Gordon (one of the authors of this paper) described in some detail the original research course sequence that was launched in 2006 at Quinnipiac University’s School of Education (Gordon, 2011). Specifically, Gordon’s article outlined the three-semester course sequence that all teacher candidates in the Master of Arts in Teaching program were required to complete (ED 550, ED 693 & ED 694). Beginning with the ED 550 (introduction to educational research), teacher candidates in this program were exposed to some of the basic concepts related to educational research, such as qualitative and quantitative research, action research and mixed methods research. As Gordon described the first part of the sequence:

Our main objective in ED 550 is for students to develop a problem statement or question in light of something from their educational experience that interests them. Based on this problem statement, students are required to write an 8- to 10-page review of the literature paper. The goal of this literature review is to help students think deeply about their selected problem statement from multiple perspectives, and to situate the issue in a broader educational context. Ultimately, this literature review is used to help students refine their research questions and design a research project in the Fall. (Gordon, 2011, p. 30).

Based on the problem statement and literature review that our teacher candidates completed in the ED 550 summer course, in the ED 693 (during the following Fall semester) they were required to design and implement their action research project while collecting data in the schools in which they were serving as full-time interns. Finally, in their last semester in the program, teacher candidates enrolled in ED 694, which was intended to assist them in the analysis of the data they collected in the Fall and the completion of their research paper. The research paper served as capstone project and was modeled after the criteria of journal articles in education. Both the ED 693 in the Fall and the ED 694 in the final Spring semester are conducted as independent studies, meaning that the teacher candidates meet individually with their assigned university instructor who guides them through the process of refining their research question, designing the study, data collection and data analysis.

Gordon’s 2011 study focused on the impact of our university’s research course sequence on some of the recent graduates from the Master of Art’s in Teaching program in the School of Education at Quinnipiac University. Back then, Gordon determined that the impact of the course sequence was largely positive in that it encouraged former teacher candidates to become more reflective and critical in their approach as teachers and increased their collaboration with their peers at the schools in which they were working. Most importantly, Gordon’s 2011 study suggested that the research course sequence helped our teacher candidates develop the mindset of a teacher researcher and reflective practitioner. In the conclusion of his 2011 study, Gordon emphasized the value of

teacher preparation programs focusing on the cultivation of this mindset, an argument that is reminiscent of Cochran-Smith's and Lytle's point about the need to view inquiry as a stance rather than as a basic skill:

Adopting a mind-set of a teacher researcher and reflective practitioner can help new teachers and teachers in general approach their craft as learners, ones who are open to making adjustments and changing course when something is not going right. Embracing this mind-set can lead teachers to think deeper and more systematically about their goals, lessons, and methods, thereby keeping them on their toes and preventing them from just going through the motions. It can help them cope with those complex, sticky, and unexpected moments of teaching, which no book, expert advice or even experience can prepare them for. (Gordon, 2011, p. 36)

Still, the findings of the Gordon's 2011 study were not all positive since the original research course sequence at Quinnipiac University's School of Education had some significant limitations. In particular, one of the main disadvantages of the sequence stemmed from the way we had originally structured the courses, requiring our teacher candidates to select a research problem in the summer course before they were placed as interns in public schools. As such, many of them lacked the opportunity to select "authentic problems," problems that not only interested them but were actual issues in the schools in which they were placed. After interviewing former teacher candidates that had gone through the original course sequence, Gordon concluded in his 2011 study that

it would have been better to research an issue that comes out of their teaching experience rather than just a topic that they may be interested in but has no relationship to the classroom or school in which they are working (Gordon, 2011, p. 34).

In short, our evaluation of the original course sequence taught us that teacher candidates need some practice in investigating actual problems that they encounter in their field sites. As it turns out, this insight proved to be one of the main triggers that drove us to revise the original research course sequence.

In the new design of our research course sequence that was launched in the summer of 2017, the ED 550 continued to serve as an introduction to educational research course. ED 550 was originally designed to help our teacher candidates become familiar with the characteristics of different types of educational research (quantitative, qualitative, mixed-methods, action) as well as with the basic qualities of a good research question and the importance of conducting a literature review. However, in the new version of ED 550, we put even more emphasis on the characteristics of action-based teacher research and especially on helping students become familiar with the notion of "problems of practice." Guided by their instructors, students examined several examples of problems of practice, including how previous teachers researched these problems, analyzed the evidence and designed interventions in order to improve their teaching (more on problems of practice in the next section).

In the ED 693 (the Fall), teacher candidates were required to collaborate with their internship advisors (veteran teachers who serve as their mentors in the schools) in order to identify a problem of practice that was an actual challenge at the school in which they were placed. In many cases, these problems were related to the school or district goals and improvement plan. Our teacher candidates worked together with their internship advisors to research their respective problems of practice including their background, reasons and context as well as strategies on how to address them. During the Fall semester, our teacher candidates were tasked with conducting a literature review of their problems of practice and with sharing the main finding of this literature review with their internship advisors. Then, in the ED 694 (final Spring semester), our teacher candidates created an intervention plan for their problem of practice based on the research that was done in the Fall and conversations with their internship advisors. Teacher candidates were then expected to implement the intervention plan and to assess the extent to which this plan adequately addressed their problems of practice. Finally, teacher candidates were asked to prepare a reflective product (e.g. PowerPoint, brochure, poster) that included a description of their problem of practice, literature review themes, intervention plan, results of what they had learned, and an outline of the next steps. Our teacher candidates were also expected to share the results of their study with a broader audience than just the internship advisor, such as at a faculty or grade-level meeting, data team, or with their peers in our Master of Arts in Teaching program.

This description of the changes made to the research course sequence at Quinnipiac University's Master of Arts in Teaching program illustrates that the revisions were motivated by a need to address one of the main weaknesses of the original version: that our teacher candidates were generally researching contrived issues, albeit ones that interested them, rather than authentic problems of practice in the schools in which they were interning. In contrast, with the new format of the sequence, our teacher candidates had an opportunity to become familiar with the notion of problems of practice, how to research such problems, design intervention plans and evaluate those plans. Moreover, in the revised version of the sequence, they gained a deeper understanding of how embracing a research mindset and an inquiry stance could serve them once they became teachers in their own classrooms. We suspect that the revised version of the research course sequence will help our teacher candidates internalize the insight that teaching and research should not be conceived as distinct roles for educators, but, ideally speaking, go hand in hand and are mutually beneficial. In the next part of this paper, we move to a deeper examination of the notion of problems of practice while drawing on two examples to illustrate how teachers go about researching them.

### ***Problems of Practice***

The notion of a problem of practice typically refers to a challenge that the school staff does not yet have the knowledge and expertise to adequately address. Problems of practice tend to be nagging issues that teachers, administrators and other school personnel need to learn more about so that they can get better at dealing with them. Elizabeth City, Richard Elmore, Sarah Fiarman & Lee Teitel (2009) have identified some of the underlying characteristics of a problem of practice:

- Focuses on the instructional core.
- Is directly observable.
- Is actionable (is within the school's/district's control and can be improved in real time).
- Connects to a broader strategy of improvement (school, system).
- Is high-leverage (p. 102).

In short, problems of practice are issues that school staff really care about and that if acted on could make a genuine difference in student learning and engagement.

To further illustrate the significance of problems of practice, let's consider the example of Scott Bodamer, a middle school science teacher at Claremont Academy (7-12) located in Worcester, Massachusetts. Given the fact that Scott's eighth grade class contained a majority of English language learners and since the traditional strategies he had learned to teach ELL students did not seem to be working, he was curious to investigate how he could better engage his ELL students in science lessons. Eventually, after some reflection and as a result of partnering with a university-based researcher from Clark University (Natasia Lawton-Sticklor), Scott settled on the following research question: How does positioning students as experts impact the way they engage with science? As the two researchers describe the project they embarked on,

This project focused on an ecology unit for eighth-grade students. One class of 21 students collaborated with a high school Spanish class. Within this eighth-grade class, 16 were classified as English language learners (ELLs), and we estimate that seven of those students felt more comfortable communicating in their native language. The primary goal of the collaboration was to engage ELL students, all Spanish speakers, by allowing them to connect with the material in their native language through the support of a teacher and other students who spoke Spanish. Students worked in small groups and chose an environmental issue to research and present. High school students supported each group, advising on the research process and presentation skills, as well as offering language support. Spanish-speaking students conducted all of their work in Spanish, and their written and oral presentations were translated by their group mates. (Lawton-Sticklor and Bodamer, 2016, p. 397)

In order to assess the impact of this intervention, Scott conducted two 45-minute focus group discussions with his eighth graders who had collaborated with the high school students on this ecology project. During these focus group meetings, students were asked to describe their experiences collaborating with others and to explain how they managed to overcome the challenges of this project. In his analysis of the focus group discussions, Scott

reports that he was heartened to discover how engaged his students felt while working on the ecology projects yet surprised to learn that “several students expressed that they did not feel like experts in their topics because they realized how much more there was to learn”(Lawton-Sticklor and Bodamer, 2016, p. 401). Apparently, his students’ investigations of environmental issues led them to make complex connections and to realize that they still had much to learn in order to master these issues.

Another example of a teacher who investigated a problem of practice in his classroom is Matt Wayne who teaches sixth grade language arts in a diverse Manhattan middle school. When Wayne discovered at the beginning of the school year that many of his sixth graders were reluctant readers or had negative attitudes toward reading alarm bells went off in his head. Following some careful observation of his students’ reading habits, a survey of their attitudes toward reading and an examination of their state test scores in reading, Wayne eventually settled on the following research question (problem of practice): “How can we get books into the hands of struggling readers so that they can become excited about reading and attain the challenging reading standards?” (Myers & Rust, 2003, p. 24). Contributing to Wayne’s decision to focus on this question is his observation that many of his struggling readers were choosing books for independent reading that were considerably higher than their reading level. Not wanting to appear ‘stupid’ in the eyes of their friends was seemingly more important to these students than selecting books that they could actually understand.

Wayne’s intervention to combat the problem of practice in his classroom—struggling readers not selecting appropriate books and having a negative attitude toward reading—included reorganizing the classroom library:

Following the suggestion of a literacy support person from the district’s professional development team, I organized the library books by reading level, creating four different categories. Inside each book I placed a colored sticker: red indicating the easiest level, blue the next easiest, then yellow, then green. To determine book levels, I looked at general characteristics—length, print size, illustration, vocabulary, and syntax. I then put two stickers into each student’s reading journal. The stickers indicated which color-coded section the students were to choose from. (Myers & Rust, 2003, p. 25)

By directing students to particular sections of the classroom library, Wayne sought to increase the chances that his struggling readers would pick books on their actual level while still providing them the freedom to choose books from within those sections.

Reorganizing his classroom library proved to be quite successful in getting Wayne’s struggling readers to make better book selections and become more enthusiastic about reading. This finding is evidenced by Wayne’s observations of the books that his students were choosing after reorganizing the library as well as by the quality of the book talks that his students engaged in after independent reading in which they described to a partner what they had read and reacted to it. Still, not all of Wayne’s students showed significant improvement in their reading skills as a result of the interventions that he had implemented. In particular, Wayne describes the case of Yolanda who found it very difficult to express herself both in writing and orally and had a negative attitude toward reading. He thus decided to present Yolanda as a case study in a professional development meeting in which teachers met weekly to discuss problems of practice in the school. When Wayne shared his difficulties with engaging Yolanda, other teachers in the schools talked about their own struggles with her and raised some ideas that had worked for them with resistant students. Summarizing the discussion with his peers, Wayne notes that “the meeting evolved into a brainstorming session in which we discussed teaching strategies to address the needs of students like Yolanda” (Myers & Rust, 2003, pp. 29-30).

In light of these two cases of teachers addressing issues that arose in their classrooms, we are now ready to extrapolate the process of tackling a problem of practice. The first step involves identifying the problem while making sure that it is related in some significant way to student learning and the instruction they are receiving. Following a careful characterization of the problem of practice, the next step entails designing an intervention plan to address this problem based on the literature review. The third step consists of implementing the intervention plan and carefully monitoring how students respond to it. After the implementation of the intervention plan, teachers need to evaluate to what extent this plan was successful while making adjustments when necessary. Finally, teachers need to be mindful of the fact that the problem of practice they have identified may not be unique to them and that it is very likely that other teachers in that school or district are experiencing

similar issues. As such, intentional efforts should be made to share one's problem of practice with other teachers in the school and to relate it to broader school and district initiatives or improvement plans. In the next parts of this paper, we outline the research design that was employed in this study and then examine two years of data with our teacher candidates researching problems of practice in order to assess whether or not the revisions that we made to the research course sequence have been successful in producing the results we were hoping for.

### ***Research Design***

In order to gather some useful input regarding the changes made to the research course sequence, we designed anonymous on-line surveys that were administered to two separate cohorts. First, we gathered information from teacher candidates that were enrolled in the last component of the course sequence and were set to graduate in the Spring of 2019. The survey questions listed below asked these candidates to discuss the impact that going through the course sequence had on their overall learning, understanding of the concept of problem of practice, and ability to be a reflective professional. Our goal here was to collect both quantitative and qualitative feedback pertaining to the changes that we made to the curriculum (i.e. the focus on a problem of practice) as well as about the entire process of going through the course sequence.

The second cohort was comprised of former candidates who had graduated from our program the previous year, had also experienced the new format of the research course sequence, and were already practicing teachers. The intent of collecting input from this group was try to determine whether or not the research course sequence had any long-term impact beyond the initial stage in which the candidates were required to design, implement and reflect on their problems of practice. We assumed that there was value in collecting data from individuals that had already graduated and were working as elementary or secondary teachers. In particular, we hoped that this cohort could provide us with additional insights on the extent to which the changes we made to the research course sequence were relevant to teachers that were working "in the field" and having to negotiate actual problems of practice. Below are the questions that were sent to the two cohorts with the fourth question only sent to the second, the practicing teachers:

1. On a scale of 1-10, 10 being the highest impact, please rate how the Problem of Practice project impacted your overall learning.
2. On a scale of 1-10, 10 being the highest impact, please rate how this project impacted your understanding of the concept of Problem of Practice.
3. On a scale of 1-10, 10 being the highest impact, please rate how this project impacted your ability to be a reflective professional (as intern and student teacher).
4. On a scale of 1-10, 10 being the highest impact, please rate how any learning from this project has impacted your current teaching practice.

For the first cohort, we sent the surveys to a total of 51 teacher candidates who were set to graduate in the Spring of 2019 and received a twenty six percent response rate (n=15). The surveys were administered in late April once all of the teacher candidates had finalized all of their coursework and had already completed the intervention for and reflected on their respective problems of practice. For the second cohort, we administered the survey to 50 former candidates that had also gone through the revised research course sequence and were first-year practicing teachers. Sixteen percent of these surveys were returned (n=8). Multiple attempts to elicit responses from both cohorts were made. Surveys consisted of Likert-style questions, with participants responding using a scale of one (low impact) to ten (high impact). Each question was followed by a field eliciting qualitative input, which asked participants to explain the reasoning leading to the impact rating. When developing questions, we sought input on three main themes: research course sequence impact on overall learning, impact as it relates specifically to the concept of problem of practice, and impact on cultivating the skills of reflective practitioners. Once we collected the survey data, we each reviewed and analyzed this data independently before convening together to discuss the findings, thereby enhancing the validity of the results.

### ***Data and Analysis***

Figure 1.1 below includes three bar graphs that illustrate the statistical breakdown of the first cohort's (2019 teacher candidates enrolled in the last semester of the program) responses to the three questions on the survey. A close examination of the data presented in figure 1.1 indicates that the vast majority of participants had positive

responses to the three questions on the survey. Specifically, 87% of the participants responded favorably to the first question (based on a rating of 7 or higher), 80% responded favorably to the second question, and 93% gave positive responses to the third question. The largely positive responses we received on the numerical scale by this cohort of teacher candidates suggests that the redesign of the research course sequence—which placed an emphasis on understanding, identifying and analyzing problems of practice—had a significant impact on these candidates.

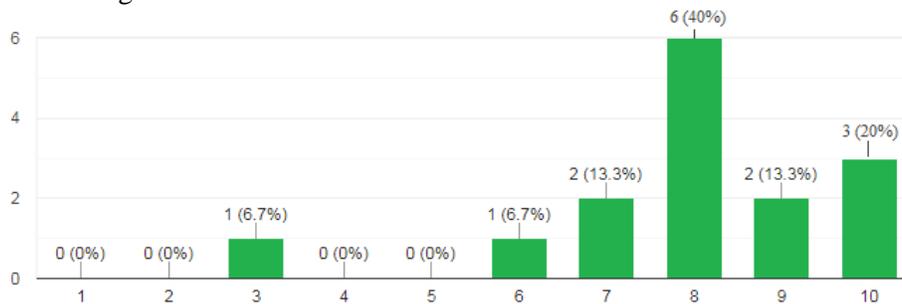
Aside from the numerical ratings provided on the survey, the first cohort also shared some valuable qualitative data, which gave us further insight into the impact of the redesigned sequence on our candidates. For example, in response to the first survey question (regarding how the problem of practice project impacted their overall learning) two candidates wrote:

The process of identifying and researching a problem of practice influenced my instruction during my student teaching. Once reflecting on the strategies that I researched, I needed to consider which methods would work best with my specific students. Then, the feedback that I received from students in the form of survey responses equally informed my instruction. I believe that the process of adapting research to our individual classrooms and instruction was an invaluable experience. The process of research and the feedback loop as well as assessment of data are all skills that will be applicable to our future classrooms.

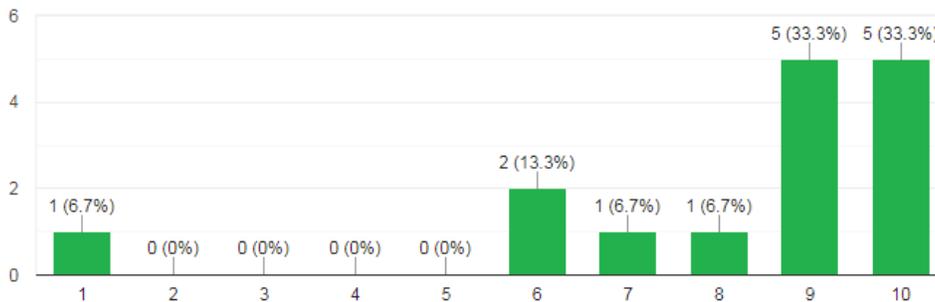
This project helped me become thoroughly knowledgeable about a specific issue I was noticing in my internship. I now feel as though my intervention plan has become a regular component of my instructional practice which I will continue to implement in my own classroom.

**Figure 1.1**

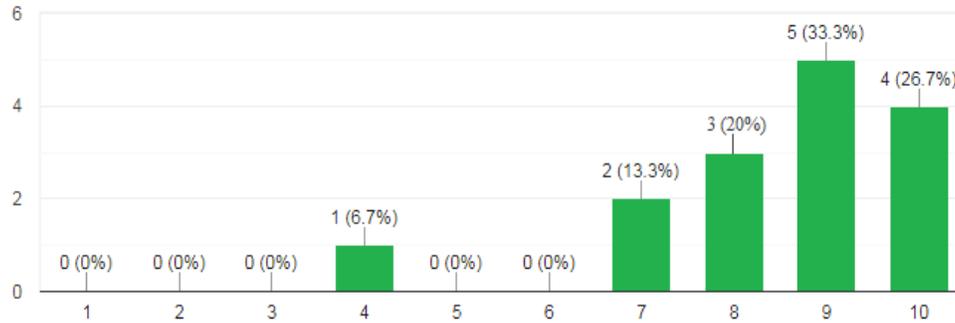
1. On a scale of 1-10, 10 being the highest impact, please rate how the Problem of Practice project impacted your overall learning.



2. On a scale of 1-10, 10 being the highest impact, please rate how this project impacted your understanding of the concept of Problem of Practice.



3. On a scale of 1-10, 10 being the highest impact, please rate how this project impacted your ability to be a reflective professional (as intern and student teacher)



Similar to the qualitative answers to the first survey questions, the teacher candidates' responses to the second and third questions were quite positive. For instance, one respondent to the second question (on how the research project impacted their understanding of the concept of problem of practice) noted that "the project not only introduced me to a problem of practice, but it also allowed me to delve into that problem through research, which therefore conceptualized the problem of practice further." Responding to the same question, another candidate wrote that "after completing this project, I think I now truly understand what a problem of practice is and how to go about engaging in developing an intervention plan to solve the problem of practice."

With respect to the third survey question (how this project impacted their ability to be reflective professionals), one candidate summarized what many of her peers probably experienced when she wrote that:

Through research, my action plan, and data, I was able to reflect on my own teaching practices and strategies. For instance, if the student data displayed evidence of struggle, I was able to reflect on the specific teaching strategies that were ineffective and go from there accordingly.

Based on these qualitative responses, it is evident that many teacher candidates in the first cohort felt that engaging in the problem of practice project positively impacted their teaching practice and ability to be more reflective during the internship and the student-teaching experience. The qualitative feedback we received also suggest that the teacher candidates surveyed recognize that it is important to make instructional decisions based on the best available evidence. Finally, their comments display an awareness that teaching and research should go hand-in-hand, which was one of the main goals of the research course sequence and the problem of practice project.

Figure 1.2 below includes four bar graphs depicting the statistical breakdown of the second cohort's (2018 graduates that were already working as first-year teachers) responses to the four questions on the survey. An examination of the bar graphs indicates that 62.5% of survey participants responded favorably to the first three survey questions (the same questions that were given to the first cohort) whereas only about 43% responded positively to the fourth question, regarding the extent to which the problem of practice project impacted their teaching practice. When comparing the bar graph results in figure 1.2 to those of figure 1.1, it became evident to us that the first cohort's responses (current teacher candidates) to the three questions that were common to the two surveys were significantly more positive than those of the second cohort (first-year practicing teachers). Although the small number of survey respondents preclude us from drawing any definitive conclusions, we suspect that the difference between the numerical results of the first cohort versus the second can be attributed to a variety of factors.

First, it makes sense that the first cohort (consisting of a group of teacher candidates in their last semester in the program who were surveyed right after they completed the problem of practice project) had more positive responses because the issues that were raised by the survey questions were fresh in their minds. In contrast, the second group of participants were already practicing teachers and were close to a year removed from the problem of practice project, thereby increasing the chance that some of them had forgotten various details about this project. It is also safe to assume that the second group of participants were negotiating a great deal of issues in their classrooms and, therefore, may have had more pressing problems on their minds at the time they were

surveyed. In addition, it is reasonable to conclude that the first cohort’s more positive responses to the three survey questions can be partially attributed to the fact that this group of candidates went through the revised research course sequence during the second year of implementation after some enhancements and tweaks were made. Thus, we suspect that some improvements that were made to the revised research course sequence between the first and second year of implementation, could have contributed to the more favorable attitudes toward the sequence and the problem of practice project displayed by the first cohort.

Much like those of the first cohort, the qualitative responses of the second cohort were mostly positive. For example, one teacher wrote in her response to the first survey question that “It helped me think about my classroom differently; I was able to focus not just on the academic improvement of my students but also on their interest in the material.” Another teacher who responded to the same question explained that “the problem of practice project reinforced the importance of data and reflection in my teaching.” In response to the second survey question, one teacher noted that the problem of practice project “reminded me that it is important to reflect on our class and improvements we need to think about making rather than just focusing on the next lesson.” Still, with respect to both cohorts not all of the qualitative responses we received on the surveys were positive. Below we include a sample of four different comments from the two cohorts that were more critical in nature and represent the range of concerns that were raised by the survey respondents:

I feel that it was a good project, but that it was a lot to juggle with all of our other commitments such as edTPA, Praxis, and student teaching this semester.

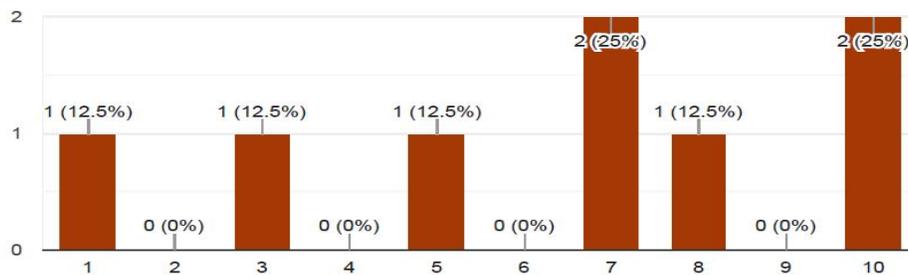
I still feel like I don't have an entirely firm grasp on what a Problem of Practice is, but I do feel that I'm on my way to understanding it.

We were limited on what we were able to pick. It had to be literacy or math. Not what I was passionate about.

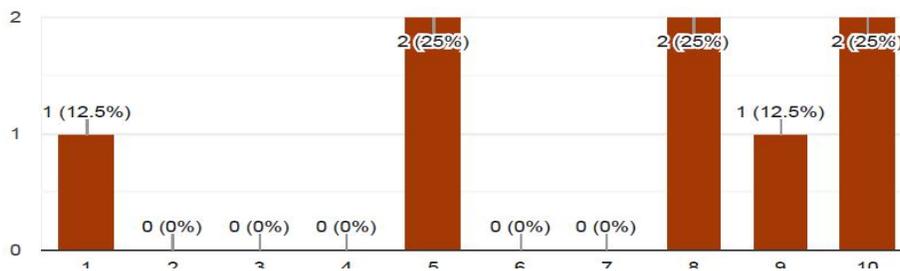
The project was helpful to an extent, but seemed impractical in terms of how a Problem of Practice can actually be used and implemented by a classroom teacher on a more everyday basis.

**Figure 1.2**

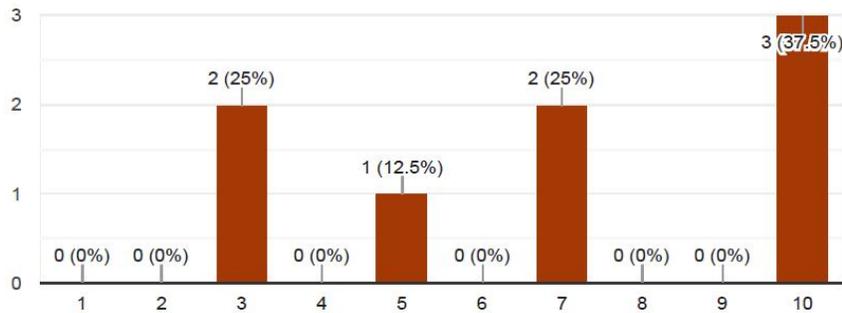
1. On a scale of 1-10, 10 being the highest impact, please rate how the Problem of Practice project impacted your overall learning.



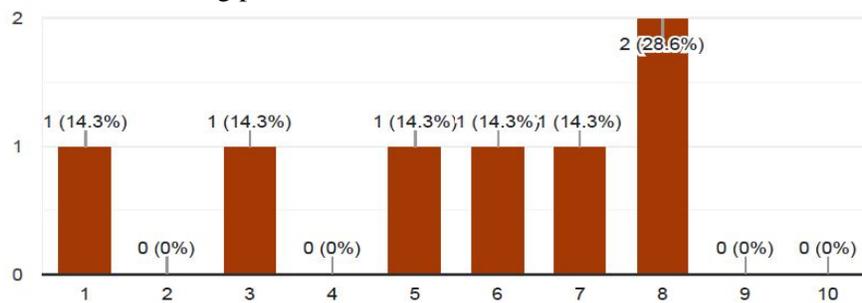
2. On a scale of 1-10, 10 being the highest impact, please rate how this project impacted your understanding of the concept of Problem of Practice.



3. On a scale of 1-10, 10 being the highest impact, please rate how this project impacted your ability to be a reflective professional.



4. On a scale of 1-10, 10 being the highest impact, please rate how any learning from this project has impacted your current teaching practice.



These comments suggest that a number of our teacher candidates and practicing teachers were concerned about issues of workload, limited choices for the research topic, inadequate understanding of the concept of problem of practice, as well as questions of applicability to the classroom. Nonetheless, these concerns reflected the minority opinion whereas the majority of the survey participants had positive reactions to both the research course sequence and the problem of practice project. Specifically, an analysis of the qualitative data from the two cohorts indicates that the majority of the respondents felt that going through the research course sequence enhanced their understanding of the notion of problem of practice, appreciation for the connection between teaching and research, and ability to be reflective professionals. One survey respondent highlighted the knowledge and skills she acquired, which we suspect was equally true for many of her peers:

After completing this project, I think I now truly understand what a problem of practice is, and how to go about engaging in developing an intervention plan to solve the problem of practice. Experiencing the process myself made me feel more prepared for when my internship school was selecting a school-wide problem of practice for instructional rounds.

### ***Discussion and Conclusions***

What did we learn by conducting this study about the impact of the revised research course sequence on teacher candidates and first-year teachers who had graduated from the School of Education at Quinnipiac University? Specifically, what insights did we glean from our study that might be relevant for other teacher education programs, which might be thinking about adding a research component or revising their existing one? First, both the quantitative and qualitative results of the surveys collected from the two cohorts outlined above clearly indicate that the decision to refocus the course sequence on researching problems of practice was highly beneficial for our teacher candidates. One candidate from the first cohort summarized what many of her peers felt when she noted on her survey that the “Problem of Practice project is extremely relevant. The skills which we practiced throughout this project will directly influence our success in being effective teachers in our future classrooms.” This view was echoed by several of the university instructors who advised our candidates during the two semesters in which they were required to work independently to identify a problem of practice, conduct a literature review, design an intervention to the problem, implement the intervention and then reflect on the results. For instance, when we asked these instructors for informal feedback on their assessment of the problem of

practice project, one of them noted that “the projects have evolved in the past year to demonstrate a deeper understanding of the skills necessary to use reflection to better plan for and meet [public school] students’ needs.” Thus, we feel that there is a tremendous benefit in exposing teacher candidates to the notion of problems of practice in teacher education programs and in using research courses to introduce candidates to the process of negotiating such problems.

Second, a close examination of the quality of the products that our candidates created at the end of their research (e.g. PowerPoint, website, or brochure) to illustrate the process that they went through to address their respective problems of practice suggests that the majority of them ended up researching problems that were not only interesting but highly relevant for their schools and districts. For example, one of our 2019 graduates researched the question of “how can teachers develop students’ abilities to model through the use of model-eliciting activities in the elementary math classroom?” Another candidate from the same cohort focused his research on identifying and assessing “effective strategies for conducting peer reviews in high school English classes.” Finally, a candidate that graduated in 2018 focused her research on “how can strategy groups be used to help students in a second-grade classroom improve their writing?”

Our overall assessment of the quality of the products created by our candidates in the past two years (since the redesign of the sequence to focus on problems of practice was implemented) indicates that they are definitely meeting the expectations of this assignment. In particular, our candidates have demonstrated an ability to identify a problem of practice, contextualize that problem, conduct a literature review, design and implement an intervention to the problem, and assess the results of the intervention. Still, we continue to monitor the products that our candidates are submitting at the end of the research process in order to identify areas that need improvement such as how to enhance the reflection component of this assignment.

Third, and perhaps most importantly, we believe that the problem of practice project gave our candidates an opportunity to experience the entire process of engaging in authentic teacher research, which will be very useful for them when they become teachers in their own classrooms. Indeed, one of the university instructors who advises our candidates during the problem of practice process captured this point when he noted that

The intervention plan really requires candidates to understand and discuss the nature of the problem in some detail, and then explain how they plan to develop an intervention plan to address the problem of practice while addressing the research from the lit review. Those who did this well went into great detail as to how they would do what, when, where, why, how, and to whom.

Hence, as this research instructor indicates, one of the most important insights that our teacher candidates are acquiring through the problem of practice project and the research course sequence in general is how to navigate the various steps of conducting teacher research. Yet, this instructor also suggests, and we believe this to be the case, that our candidates are learning to reflect on a deeper level and that, in fact, they are beginning to think like teacher researchers.

Finally, recall that the survey results of the two cohorts indicated that the impact of the problem of practice project was significantly higher for the teacher candidates who graduated in 2019 than for the practicing teachers who graduated in 2018. This difference suggests that it is possible that the shorter-term impact of the problem of practice project was stronger than the longer-term effect and that perhaps some of the practicing teachers did not retain important insights that they had learned the previous year. Therefore, it is probably worthwhile to spend some time reflecting on the following questions: what, if anything, can teacher educators do to help candidates retain the research skills and knowledge they have been taught in teacher education programs for the long term? In other words, how can we help candidates not only acquire but also internalize the research competencies they will need as teachers? The present study did not address these questions though we certainly intend to consider them in the future; they are definitely issues that seem to us to warrant further research.

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