Rocket to Creativity: A Field Experience in Problem-Based and Project-Based Learning

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Abstract

This article reports the impact of a field experience in problem-based (PBL) and project-based learning (PjBL) on in-service teachers' conceptions of experiential learning. Participants had been enrolled in a hybrid class that included an online component in which they learned about PBL and PjBL, and an experiential component in which they facilitated PBL and PjBL with children in grades 1-9 during a one-week field experience on a university campus. The goal of the field experience was for teachers to change their practice from didactic to inquiry, and to promote critical and creative thinking in their students. A case study method was used that involved data derived from six different sources: online structured interviews, follow-up telephone interviews, discussion board posts, reflections, course feedback, and observations. The main theme that emerged from the data analysis was the critical role the field experience played in applying theory to practice. Sub-themes included understanding the process of implementing PBL and PjBL, mastering the logistics of PBL and PjBL, becoming facilitators, and collaborating with partners. Results showed that the field experience gave the teachers the "courage" to experiment with a student-centered methodology.

Keywords

field experience, clinical practice, experiential learning, problem-based learning, project-based learning

Introduction

This study examines the role that a field experience in experiential learning, specifically problem-based (PBL) and project-based learning (PjBL), played in teachers' conceptions. Field experiences, also referred to as clinical practices, are key components of today's teacher education programs as they give candidates the opportunity to connect theory and practice (Darling-Hammond, 2006; Hammerness, Darling-Hammond, Bransford, Berliner, Cochran-Smith, McDonald, & Zeichner, 2005;

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National Council for Accreditation of Teacher Education, 2010; National Council for Teacher Quality, 2011). The traditional approach to teacher education has been to learn theory in isolation from practice and many teachers, once they begin teaching, revert to the way they themselves had been taught. Lortie (1975) referred to this as *apprenticeship of observation*, a term he used to describe the preconceptions of teaching that individuals develop based on their own experience as students for 12 or more years. A number of reforms that began in the late 1980's sought to design teacher education programs that were more coherent and had stronger links between coursework and clinical practice (Darling-Hammond, Hammerness, Grossman, Rust, & Schulman, 2005). Studies have shown that these integrated programs have had greater impact on the conceptions and practices of teachers (Darling-Hammond, 2000; Darling-Hammond & Bransford, 2005; Howey & Zimpher, 1989). In her analysis of powerful teacher education programs, Darling-Hammond found that the clinical experiences in these exemplary programs were tightly tied to coursework in which tasks and problems were posed that could be further explored in the clinical setting (2006). However, field experience programs do not always achieve the objective of integrating theory and practice, and many questions still remain about how they contribute to a teacher's development (Anderson & Stillman, 2013; Opfer & Pedder, 2011). The report on clinical preparation commissioned by the National Council for Accreditation of Teacher Education (NCATE, 2010) emphasized the importance of "moving to programs that are fully grounded in clinical practice and interwoven with academic content and professional courses" (p. ii) in order to effectively prepare teachers for the 21st century. The NCATE report compared a teacher to a family doctor in that the doctor must know the knowledge base of medicine as well as be able to understand his/her patients and their symptoms in order to prescribe a course of treatment that will yield the best possible outcomes (2010, p. 27). Similarly, clinical practice prepares teachers to observe, interact with, instruct, and assess students (NCATE, 2010).

Zimpher and Howey (2013), agreeing with the recommendations of the NCATE report, advocated the establishment of university-based Centers of Pedagogy "devoted entirely to supporting all practices and innovations, laboratory and clinical, necessary for creating high-quality teachers" (p 409). In actuality, Centers of Pedagogy are both laboratories and clinical classroom sites. The Centers of Pedagogy would be sites on campus that could act as teacher-training laboratories that would contain the necessary resources and technology for developing cutting-edge practices. The Centers would also be responsible for placing pre-service teachers in schools where all teachers, veterans as well as novices, would benefit from the exchange of ideas (Zimpher & Howey, 2013).

Although there is almost universal agreement about the importance of field experience in teacher education programs, many questions remain unanswered about its contributions. Most of the research on field experience has focused on student teaching experiences of pre-service teachers in classroom settings (Anderson & Stillman, 2013). Darling-Hammond et al. (2005) and Zeichner and Conklin (2005) concluded that when field experiences are carefully coordinated with coursework and closely monitored, pre-service teachers were more successful in enacting practices in the schools and communities for which they were being trained. However, the same may not be true with in-service teachers. There is a scarcity of research of the effect of

field experiences on in-service teachers such as the participants in our study. Likewise, there is a lack of research on the effectiveness of attempts to connect theory to practice in clinical practice sites on university campuses, or, what Zimpher and Howey (2013) refer to as Centers of Pedagogy. Our research helps to fill the void with its focus on a hybrid course that consists of an online portion immediately followed by a field experience on campus with the participants being in-service teachers.

Consequently, the purpose of the study was to examine the impact of a field experience in problem-based (PBL) and project-based learning (PjBL) on in-service teachers' conceptions about using a student-centered methodology. The following question guided our study: How does a field experience contribute to positive conceptions of teachers using experiential teaching/learning models, specifically PBL and PjBL?

The field experience and its role in the Academically or Intellectually Gifted (AIG) Licensure Program are described below in detail. Following the description of our research methods, the results are discussed in relationship to the effectiveness of field experiences in the preparation of teachers to use experiential learning. The change in teachers' pedagogy from teacher-centered to learner-centered in their practice was described in a previous article (Dole, Bloom, & Kowalske, 2016).

The Academically or Intellectually Gifted Licensure Program

The 36 in-service teachers who participated in this study were all enrolled in the AIG licensure program at a university in Southeastern United States. The AIG program is a 12-credit hour program in which teachers can obtain an add-on license in gifted education. The courses were offered at both the undergraduate and graduate level. If taken at the graduate level, the AIG classes could be applied to the Master of Education in Gifted, Creative, and Innovative Education. Those teachers who already have masters' degrees or who do not wish to go on in the master's program generally take the AIG courses at the undergraduate level; thus there can be teachers with different levels of education and experience in the same class. The AIG license can be added to any teaching license: elementary, middle school and secondary content areas, special education, as well as counseling. All of the courses were offered fully online with the exception of one course, *Creative Thinking and Problem Solving*, which is a hybrid course made up of a four-week online portion and a one-week field experience called Rocket to Creativity (RTC). The field experience was held on the university campus immediately following the online part of the class. This was the only class in the AIG program that was co-taught, thus modeling the collaboration that we expected the teachers to practice in the field experience. In the online part of the class, the teachers learned how to promote creativity in their students and also learned about PBL and PjBL and then they implemented what they had learned during the field experience immediately following the online part of the class. The teachers had their initial exposure to PBL and PjBL in the *Methods and Models of Gifted and Creative Education* course that preceded the *Creative Thinking and Problem Solving* course. Three modules of the *Creative Thinking and Problem Solving* course were devoted to PBL and PjBL, with an essential question for each module: What are PBL and PjBL? How do we implement PBL and PjBL? How do we evaluate PBL and PjBL? In each module, students posted their initial thoughts on the essential question. Assignments included readings and videos of examples of implementation and evaluation of PBL/ PjBL and reflections and discussion on the Discussion Board. The major assignment was

the design of a PBL or PjBL curriculum unit that the teachers could use with their own students. The curriculum unit addressed the following: description of student population, rationale for PBL or PjBL choice, scope and sequence, pre-assessment of student interest, design and management plan, resources, evaluation procedures, and audience.

For the field experience, the instructors of the course placed the teachers in teams of two to facilitate PBL/PjBL with groups made up of five to six children in grades one through nine. Teacher teams were chosen toward the end of the online part of the course so that the teams could do some initial planning, such as locating resources. However, detailed planning was discouraged as the objective was for the children to take the lead and the teachers to facilitate. Three or four AIG licensed teachers who completed the course in the past and were experienced in implementing PBL and PjBL were employed to assist the instructors in observing, giving feedback, and assessing the teams of teachers. These teacher trainers had several years of experience teaching gifted students and education beyond the bachelor's degree. In fact, one of the trainers has her Ph.D. in gifted education, serves as adjunct faculty at the university, and is one of the authors of this article.

When the children registered for RTC they were given interest inventories that described broad topics that would be offered, and the children rank the topics. The children were then placed in groups according to the interests expressed in their inventories and their ages. There was a moderate fee charged for registration that was used to purchase supplies for RTC and for the children's lunches in the campus dining hall. Scholarships were awarded according to need. Over the 15 years that the class has been offered, there have been a variety of interest groups. Select examples of interest groups are listed below:

The We-Dig Archaeology Club
Do you dig the past? Learn the techniques of archaeology such as sifting and tracking soil and identifying artifacts.

The Inventors Club
Did you mention invention? Brainstorm a problem, identify many solutions, and design an invention to solve the problem.

Clown around with Animation
Create animated cartoons, avatars, video games, digital puzzles; the possibilities are endless...

Costume Creators Guild
Learn how filmmakers create costumes for science fiction films. Create creatures and costumes for a science fiction movie.

Typical Procedure
During the first day of RTC, children brainstorm problems or projects that they can complete during the week. The project or problem can either be individual or collaborative; however, it has to relate to the topic. Once they have decided on a problem or project, the children plan a timeline and locate resources on or off campus. The advantage to having the field experience on campus is the access to resources such as computer labs, archaeology lab, forensic lab, museums, and library. The campus is built on an ancient Cherokee village and there have been archaeology digs during the summers that the children have been able to take part in. There are also "experts" on campus as well as in the community who are willing to serve as consultants, for example, technology staff, campus police, and faculty. The children can talk via skype or hold conference calls with experts across the country. One group that was

trying to determine whether dragons had ever existed and, if not, why they were an icon across many cultures, was able to schedule a conference call with a paleontologist who had just discovered a new set of dinosaur remains from the dinosaur, *Dracorex Hogwartsia*, so named due to the resemblance of the skull to that of a dragon. That conference call led to an additional conference call with the museum curator where the remains were on display.

The teachers are expected to be on campus from 9:00 a.m. until 5:00 p.m. They meet in their teams for planning and checking out supplies before the children arrive at 10:00 a.m. The children come at 10:00 a.m. and are there until 4:00 p.m. The teachers meet together as a group with the instructors after the children have left to reflect on the day's activities and share challenges and brainstorm solutions. The teachers act as facilitators while children plan and implement their projects and activities for the week. The children create timelines and lists of the resources they need for project completion or problem solutions. With the help of the teachers, they also develop rubrics during the week that they use for self-assessment at the end of the week. See Figure 1 for an example of a student- generated timeline and Figure 2 for a student-made rubric.

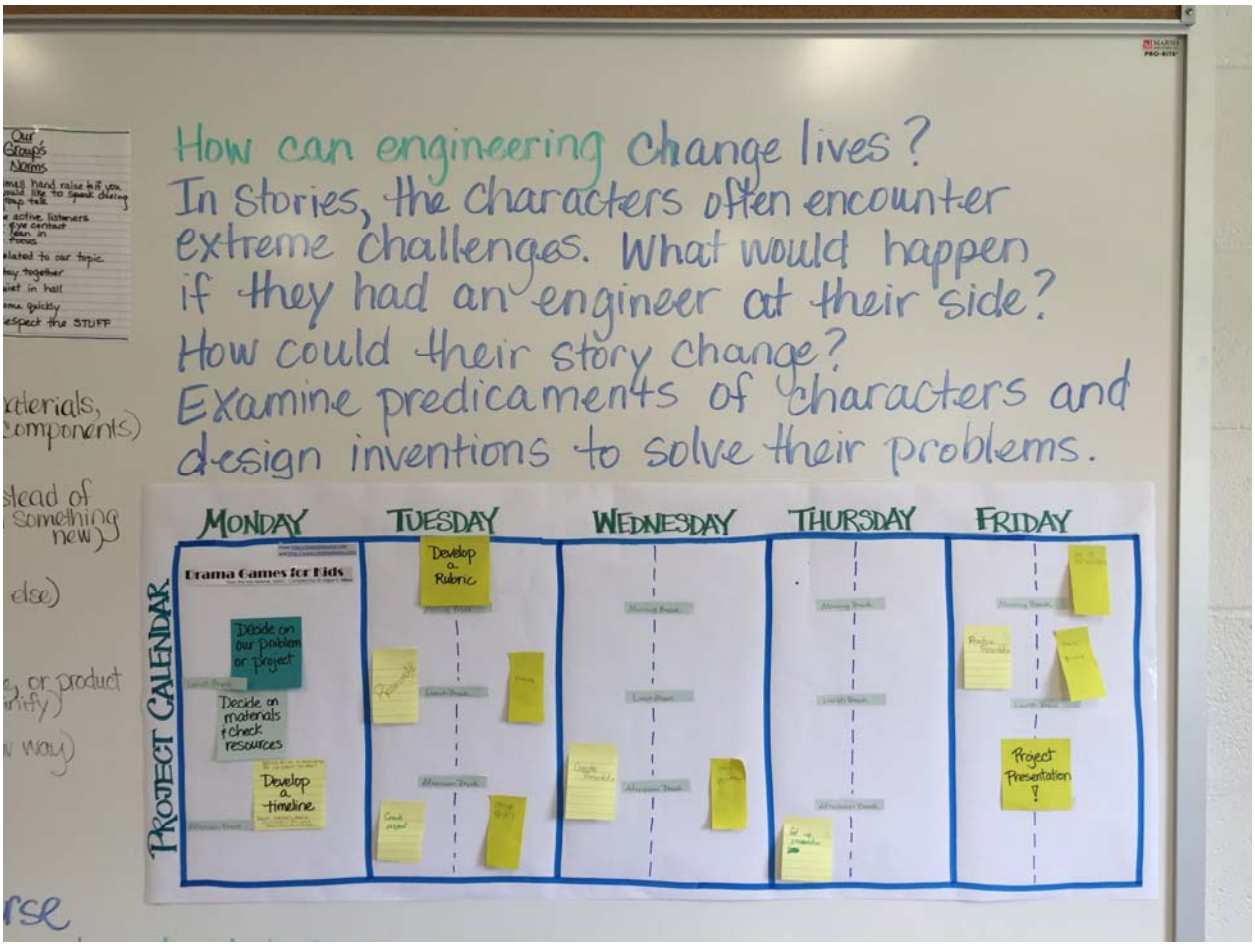

Figure 1. Example of a student-generated timeline

Clown Around with Animation

Question: How do you make stop-motion animation?
Product: stop-motion video to show parents

	Ok	Good	Excellent	Super Excellent (How can we make our video even better?)
Story	• Missing two parts (beginning, middle, end) • No problem and solution	• Missing beginning, middle, or end. • Problem or solution – didn't solve the problem	• Includes a beginning, middle, and end • Has a problem and solution	• Add more dialogue • Add details to beginning, middle, and end
Characters	• Movement is not believable • No colors • Few details • No feelings	• Some details (stick person) • Slow movement or little movement • Some feelings	• Has feelings • Lots of details (look believable) • Movement	• All characters have a name • Arms and legs move • More feelings
Video	• Only video • No background	• No sound • Some pictures and some video • Simple background (no colors)	• Many pictures put together • Sound (music or talking) • Detailed background (colorful, looks real)	• Add sound effects • Could have talking and music

Figure 2. Example of a student-made rubric

The teachers are provided rubrics on collaboration in which they assess themselves and their team partners on the major topics of contributions, taking responsibility, and valuing their teammate's ideas. They also complete a PBL/PjBL implementation checklist together at the end of the week that covers such categories as authenticity, applied learning, and active exploration. The week ends with a celebration in which family members and friends are invited to see what the children have accomplished during the week.

Method

We conducted this study to understand how RTC impacted the teachers. We sought to answer the following research question: Does a field experience contribute to positive conceptions of teachers using experiential teaching/learning models, specifically PBL and PjBL? For the design of the study, we utilized a case study method, a cornerstone for research in gifted education (Buchanan & Feldhusen, 1991). Stake (1981) noted that knowledge gleaned through case studies is different from other research

knowledge in several ways. It is more definitive because the information is vivid and concrete, as opposed to abstract. It is more contextual because experiences are grounded in the setting and the environment. Readers bring with them their own experiences and understanding, allowing the findings to be developed by reader interpretation. The reader is able to extend generalizations to populations familiar to them (Merriam, 2009). Case studies have proven beneficial for evaluating educational programs and informing policy (Merriam, 2009). At the foundation of this approach is the search for meaning and understanding. With an end product of a richly descriptive analysis of a bounded system, the researcher serves as the primary instrument of investigation using an inductive investigative strategy (Merriam, 2009). A case study explores a contemporary phenomenon within its real-life context (Yin, 2008).

Data Collection

Data was gathered in six ways: structured interviews using Qualtrics, an online survey tool; follow-up phone calls; discussion board posts; reflections of teachers at the end of each day of RTC; anonymous course feedback, and observations of teacher trainers and instructors during the week of field experience. The structured interviews included 29 open-ended and demographic questions. Half of the questions focused on PBL, and the other half addressed PjBL. The questions covered the following points: (1) a description of how PBL and/or PjBL were implemented in their teaching, (2) if they had used these methods prior to RTC, (3) how the field experience influenced their teaching, (4) how the methods have benefitted their students, (5) how learning these methods influenced their pedagogy, (6) what obstacles they faced when implementing these methods, (7) how they overcame these obstacles, (8) if they would recommend these methods to others, and (9) if they have provided professional development on these methods. They were also given an opportunity to provide further comments.

A graduate assistant conducted follow-up interviews with the four participants who indicated that they were willing to be interviewed by telephone, taking detailed notes. She asked for further description of how they used PBL and/or PjBL, how they assessed these methods, if or how they had combined these methods with other teaching/learning models they had learned in their previous coursework, how students had responded to PBL and/or PjBL methods, examples of how the field experience influenced their teaching, examples of how the methods promoted deeper learning in the students, if testing requirements from the state influenced their decisions to implement the methods, and for additional comments.

We observed teachers during their time at RTC in several ways. Throughout each day, the instructors and teacher trainers rotated from group to group listening to instruction and watching interactions between teachers and students. In addition, we met with the teachers at the end of each day for a large group discussion where they could share reflections about their experiences. In some cases, individual conferences were arranged in order to help teachers who were struggling with aspects of the PBL or PjBL process.

For the course feedback, which was separate from the course evaluations, we accessed the students' anonymous, end-of-course posts about the strengths and weaknesses of the course assignments and the field experience. We analyzed data from the past three years. Data from course feedback in prior years were not available.

Participants

The structured online interview was emailed twice to 164 graduates of the gifted licensure program. Of the 164 graduates, 50 started the online interview. Of the 50, five responded that

they did not use the methods, and the survey ended for them. Nine persons abandoned the survey without providing details about their experiences. We decided to use the remaining 36 interviews for this study because all parts of the interview were completed. Of these participants, four expressed interest in participating in a subsequent interview, and they became the ones we included in follow-up phone interviews. All but one of the participants was an in-service teacher when taking the course. However, at the time of the survey, that participant was teaching so she is counted as an in-service teacher. Of the participants, 18 worked in an elementary school setting serving Kindergarten through 5th grade. Eight teachers worked in a middle school setting teaching 6th, 7th, and 8th grades, and five worked in a high school setting serving 9th through 12th grade students. Four teachers had experience teaching in both elementary and middle school settings. One of the participants was currently working as an AIG Coordinator for a school system. All but two of the 36 participants who responded to the survey and all four of the follow-up interviewees were white females seeking AIG Certification in the Licensure Program or seeking a degree in Master of Education in Gifted, Creative, and Innovative Education. The remaining two participants were white males. The teaching population of the AIG program typically mirrors that of the United States, lacking diversity both in race and in sex. In 2008 in the United States, 83% of the teachers were European American, with 85% female in elementary schools and 58% females in secondary schools (Aud et al., 2010).

Data Analysis

Each researcher read the online-structured interviews numerous times before beginning the analysis. We used open-coding (Merriam, 2009) to record our first thoughts, and then began to organize these into themes (Patton, 2002). In order to establish inter-rater reliability (Wetherall, Taylor, & Yates, 2001), the three of us examined our data at this point. We agreed on themes that emerged from the participants' comments (Seidman, 2006) such as mastering logistics. In order to understand more about specific topics, we corroborated to craft the questions to be used in the telephone interviews. We coded comments from the online and telephone interviews, and created a table with the data. After adding the details to the table, we recorded the number of times each supporting detail was mentioned. To provide credibility for our results, we correlated the results with observations and reflections and discussion board posts during RTC and with course feedback (Farmer, Robinson, & Elliott, 2006). In addition, because all three of us had either co-taught the course or coordinated the field experience, we were familiar with the participants and the context, providing us insider status (Wetherall, Taylor, & Yates, 2001).

Results

The participants offered specific details about how RTC allowed them to apply theory to practice, thus addressing our research question of how a field experience contributes to positive conceptions of teachers using experiential teaching/learning models, specifically PBL and PjBL. Four sub-themes emerged under this main theme. Students were able to apply theory to practice as they learned about the overall process of implementing PBL and PjBL. In addition, by creating learning opportunities for children who attended RTC they understood the logistics of PBL and PjBL and they grew to understand the role of teacher as facilitator within these experiences. Finally, collaboration with peers provided an avenue for the instructors to gain knowledge about what was necessary for successful implementation of PBL and PjBL.

Understanding Process

From our observations and discussion postings in the online part of class, we noted that teachers expressed great concern in the weeks prior to RTC about not having well structured, well sequenced unit and lesson plans in place prior to coming to RTC. Hence, we observed and heard about many "aha" moments in our discussions with participants during our observations and group reflection at the end of each day of RTC. Many teachers commented on their initial discomfort and subsequent relief as they were able to experience first-hand that children were indeed able to handle not only the process of PBL and PBjL but also handle what the teachers initially perceived as lack of structure. The processes they learned about in the online part of the course weren't just tucked away in a notebook somewhere collecting dust; rather the processes such as generating and brainstorming ideas, promoting critical and creative thinking, creating timelines and rubrics were put to use immediately. Participants gained appreciation and practical understanding of those tools as they were immersed in a teaching experience where the tools were imperative.

Participants described how the field experience allowed them to understand the overall PBL/PjBL process. One stated, "It gave me an opportunity to apply the theory we learned and see project based learning in action." Another addressed how RTC allowed her to understand how the PBL/PjBL approach could be implemented in a class for gifted students. She stated, "The camp [RTC] helped me understand what projects work best for gifted minds. [The field experience] gave me resources and strategies to try." Other participants discussed how the hands-on opportunity let them understand how to plan for PBL. One said, "Going through the actual planning and implementation helped me understand the process far better than just reading about it."

Another participant expressed her appreciation for new understandings of PjBL due to the combination of coursework and the field experience. She said, "The course showed me the possibilities associated with project-based learning and gave me experience in leading students through the process." Teachers described how they modified the PBL/PjBL experiences to their own classroom setting. One participant said, "The field experience really opened my eyes to the possibility of using these types of activities."

Mastering the Logistics

To conduct a PBL/PjBL opportunity for students, there are numerous components that must be in place. It can be challenging for instructors and students to generate problems as well as plans for bringing those problems to solutions and projects to fruition.

During group reflections, teachers' comments about student engagement and motivation in working on problems and projects were numerous. At the start of the week, teachers wondered how they would fill a whole week but by the end of the week, they commented that they and their students were worried that they wouldn't have enough time. They talked about students wanting to stay late and work through lunch and breaks. They made several comments regarding the importance of the timelines and rubrics the children had generated in keeping the groups focused.

One participant expressed her satisfaction with understanding the problem-generating process. She said, "[Prior to the field experience], I didn't truly understand how to create problems for students." Another expressed how she was able to generate further units of study. She said, "It helped me to develop new PBL's for my students." Another participant expressed the importance of organization and grouping. She said, "I learned how to organize and group for better learning." Agreeing that she learned the importance of

organization, one participant added that she also learned the importance of assessments. She said, “It has helped me with long-range planning, and it has given me more options for assessing student comprehension of an objective or unit of study.”

Using experts to help in the learning process is an important component, as is presenting to authentic audiences. One teacher stated, “Allowing the students to share their work with their families was a great experience, as well as working with on-campus experts.” Two others described final presentations. One said she appreciated the last day when students presented their projects to parents. The other said, “It was great to see the kids finally put their projects on display the final day.”

Participants indicated a better idea of how PBL and PjBL can be incorporated in their own classrooms while still accommodating state mandated curriculum. One participant described her recipe for success, “You start with curriculum standards, add application, mix in relevance and authenticity and add in open endedness...”

Along with understanding the necessary components for PBL and PjBL, participants also described having a better understanding of problems they may encounter. One teacher said, “It also allowed me to consider potential issues I may face when using project-based learning in a public school classroom.” Another stated, “I learned how to use it more effectively. The field experience also gave me the opportunity to trouble shoot some of the concerns I had.”

Becoming Facilitators

Participants appreciated going through the PBL/PjBL process with their students. It allowed them to understand the role they play as facilitators and how the students move from initial concepts to final products. One said:

> I appreciated experiencing what it feels like to just let students take an idea and run with it! This was scary to me at first, as I like to "plan" things in the lesson, but as we worked through the Problem Solving I saw the benefits to both the students and to myself.

Further corroborating this aspect, one participant stated, “I learned that I need to let my students take more leadership in demonstrating their own learning.” Another said, “Allowed me to see how project-based learning can be student initiated rather than teacher- dictated.”

Participants also described changes in their attitudes toward classroom conditions and in their understanding of the learning process. During group reflections at the end of the day, many of the teachers made comments regarding giving up control. They described their initial discomfort with statements such as “I admit I am a control freak” and “This is so far out of my comfort zone.” Subsequently, however, they described their ultimate satisfaction when they learned that giving up the driver’s seat was possible.

The follow-up survey corroborated our findings about what teachers had learned about facilitating student-directed learning. One said, “It allowed me to have confidence that students are capable to complete projects in a way without the teacher driving the instruction.” Another said, “Although, I used it before, I was able to go more in-depth with ideas. Also, I learned to allow students more autonomy to explore on their own.” While another said, “It gave me a better feel for letting students take more of a leadership role instead of waiting on me, the teacher, all the time.” One participant described the most important aspect of RTC for her. She said, “Learning to let go of the control and to let my campers take charge of their learning.”

Participants described the impact on students when they have choice and engage in collaborative learning. One said, “I saw the benefits of allowing more student choice in

projects and was reminded of the engagement that occurs when students are working on projects." Another stated, "There is a variety of creative learning strategies the students can use. You give them the choice of how to present their material. They love it."

Collaboration

Participants also described how they benefitted from collaboration during the field experience. One described collaboration as being the best part of the field experience. She said, "Working with my partner, she was awesome, and seeing PBL in action." Another described her favorite aspect: "Working with my co-teacher and students in a fun, creative atmosphere." Another said, "Working with another teacher to discuss ideas and plan together." Other participants noted the importance of daily meetings. She described the strengths of the field experience as being the "teachers and meeting as a group at the end of each day to reflect." Another said she appreciated "the whole group discussions." Finally, two participants addressed the atmosphere of the camp being conducive to applying theory to practice. One said,

> What was most helpful to me was seeing all of the different groups working on different projects. It is a rare thing to be able to see other teachers in action and to share ideas. Everyone is working with their heads down.

Another participant stated, "Having the freedom and flexibility to apply PBL without the constraints of the classroom setting."

Discussion

Experiential learning requires a different structure and teaching style than many teachers are accustomed to. RTC is a field experience that immerses teachers in the world of PBL and PjBL. Teachers are required to "try it on" and "wear it around" for a week in a non- threatening environment that offers the support of veteran teachers. Through this experience we watch teachers who are accustomed to teacher-directed practices not only adjust their teaching style to one appropriate to an experiential pedagogy, but to also adjust their conceptions of teaching as well. If the notion of Lortie (1975), that teachers teach the way they were taught, is true, then teaching teachers through an experiential approach may have the best chance of ultimately transforming pedagogy.

Our results reveal that the experience of teaching with PBL and PjBL in a supportive environment changed teachers' ideas about experiential learning, specifically with regard to what it means to give up control, how to facilitate opportunities for authentic learning, and what the possibilities are for collaboration.

Giving Up Control

With the heavy emphasis on high stakes assessment and increasing appearance of scripted lesson plans and commercialized curriculum in the United States and, indeed, around the world (Ripley, 2013), many teachers fear letting their students take the driver's seat in the classroom. Our data captured this initial trepidation as well as teachers' increasing comfort level in their roles of facilitators and coaches as their week of experiential learning progressed. Trying something new takes a leap of faith that teachers may think they can ill afford in a public school setting. The data from this study indicate that experiencing the results of PBL and PjBL first hand gives teachers the confidence to let go of control. With that confidence, teachers may be more likely to use experiential practices in their own classrooms (Dole, Bloom, & Kowalske, 2016).

Authentic Learning

In the current climate of high-stakes assessment and strict curriculum mandates, teachers often claim to have little flexibility in how and what

they teach (Sleeter, 2009). Hence, in addition to trepidation regarding giving up control in the classroom, teachers may also have concerns about how experiential learning can accommodate mandated curricula and high-stakes assessment. Through this experience, teachers learned how to incorporate authentic learning and assessment opportunities with mandated curricula. Identifying real problems and projects that serve a purpose, engaging students in assessment of their own work, and providing audiences for student work, puts curriculum into meaningful context and, as our teachers experienced first hand, are highly motivating and engaging for children.

Collaboration

Many teachers are used to teaching in isolation (Lortie, 1975; Sawyer 2007). Co-teaching and team-teaching can be difficult for teachers who are used to controlling their own classrooms and lessons. As noted by our participants, one of the most rewarding aspects of RTC was having the opportunity to learn with and from their peers, establishing an appreciation for the power of collaboration.

Limitations and Further Research

Our study focused on a field experience on a university campus in which teachers worked in collaborative teams; instructors and teacher trainers experienced in PBL and PjBL were available to give feedback and an abundance of resources and technology were available, all of which increased the likelihood of the field experience being a positive experience. Additional research is needed to compare the effectiveness of various models of field experience for in-service teachers. More research is also needed with culturally diverse teachers as well as students, not only culturally diverse students, but economically disadvantaged and those with special needs. The authors are currently doing research on a field experience held in the school system of eight teachers who completed the AIG program as a cohort in place of the field experience on campus. The school system is a small district that has a very culturally diverse student population as well as a high percentage of economically disadvantaged students. The advantage of having the field experience in their own school system was that the teachers were able to facilitate PBL and PjBL with their own student population that differs significantly from the student population of the on-campus field experience, which is primarily White middle class.

In addition, teacher education programs need to provide more opportunities for candidates to learn collaborative skills to be effective co-teachers in order to meet the needs of all students (NCATE, 2010). Although there has been research on co-teaching in inclusion classrooms with one general education teacher and one special education teacher, there has been little research on co-teaching in general education classrooms (Bennett & Fisch, 2013).

Our research contributed to the body of research on the importance of connecting theory to practice in teacher education and, perhaps even more significant, to the scarce research on field experience for in-service teachers. This course with its accompanying field experience on PBL and PjBL, or any similar course on experiential learning, could be duplicated across the globe, even in countries where there are fewer resources. Teachers may be more creative when there are fewer resources available and what would, on the surface, appear to be a disadvantage could turn into an advantage when doing PBL or PjBL (Strawn & Monama, 2012). Various studies across the globe indicate that educational reforms aren't successful without changes in teacher conceptions (Small, 2014; Song, 2015). As our data and other research indicate, meaningful experience may be the ticket to changing teacher's conceptions and ultimately practice.

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