Getting outside: Three teachers' stories of using the schoolyard as an integrated tool for elementary teaching

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Abstract

There is limited research to suggest the student-based and school-wide impacts of school gardens, and even less research regarding the teaching practices that are necessary to encourage the success of an outdoor classroom. Despite the lack of research, teachers are successfully integrating their outdoor classrooms into their students' learning experiences. The purpose of this study is to better understand the experience of learning to teach in the school-yard and school garden through the use of teacher narratives. The experiences of three teachers are told collectively as a layered narrative that describes first impressions, barriers and hesitations, beginning to teach outside, and teacher change.

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When students are able to touch their learning, experience it in real life, their understanding seems to emerge like snap peas peeking out of the fresh dirt. Their green tips poking above the nourished and moist earth. Nurtured with care and attention, they stretch and reach for fresh air and sun. In time, leaves unfold, fruit appears, and the peas know. --- Author

Introduction

Qualitative inquiry provides a unique opportunity for the stories of research collaborators (participants) to be heard. Referring to Dewey's importance of experience, the qualitative form of narrative inquiry provides the best way of understanding and representing the personal and social experience of the teacher (Clandinin & Connelly, 2000). "Narrative is a way of characterizing the phenomena of human experience and its study which is appropriate to many social science fields" (Connelly & Clandinin, 1990 p. 2). Using the narratives of teachers allows for an opportunity to understand the context of teaching as well as provide significance and reflection opportunities for the teachers' experiences (Greensfeld & Elkad-Lehman, 2007). The

usually isolated teacher finds an opportunity to reflect and share their practices and potentially combat the feeling of working in solitude (Lyons, 2002).

Providing a framework for the stories of the successful teacher to be told requires a collaboration of researcher and participant. The caring context of conversational research is more inclusive, meaningful and valid, "It helps teachers to know more, and to know that they know more" (Lyons, 2002, p. 171). The use of reflective, narrative research not only benefits the researcher but also the participants as they tell their stories and relive their experiences. The use of narrative research in education provides the educator an opportunity to understand their solutions to barriers and to share those solutions and make their voices heard (Greensfeld & Elkad-Lehman, 2007). "Narrative research can contribute to our understanding of the complex world of the classroom" (Gay, Mill & Airasian, 2009 p.385), even (or especially) when that classroom expands beyond four walls and into the schoolyard.

"Narrative is a method of inquiry and a way of knowing - a discovery and analysis" (Ely, Vinz, Downing & Anzul, 1997, p. 64). Creating an opportunity that allows teachers to tell their stories that reveal their understanding and meaning-making of using the schoolyard as a teaching tool provides an insight that other methods of research may miss. The stories of teachers can describe how they stepped into a school with a garden and got their hands dirty.

Rationale

Within the last two decades there has been more of an interest in the design and installation of school gardens on elementary campuses across the United States, especially in California and Texas (Blair, 2009). This recent push for school gardening relies on a variety of theoretical understandings. John Dewey (1916) argued for true, lived experiences as a way of solidifying student understanding and connections. Foran (2005) stated that the encouragement of outdoor lessons is a reminder that educational growth "comes to us from nature, we gain by our experience of our surroundings" (p. 154). Students can come to understand the process of the life cycle of plants as they watch the seeds they have planted sprout, grow leaves, bloom, and form edible fruit with more seeds. Blair (2009) called the purposes of the redesigned schoolyard academic, behavioral, recreational, social, political, and environmental. Not only can students gain knowledge and understanding from their experiences in the schoolyard, but they can also begin to appreciate the natural resources around them and engage in a sustainable manner of thought and behavior. School gardens are based on hands-on, constructivist learning where students apply knowledge to real life problems and situations (Klemmer, Waliczek, & Kajicek, 2005). Thorp and Townsend (2001) referred to gardens as providing "a useful venue for experiential learning both academically and developmentally" (pp. 347-348). The school garden provides a unique opportunity for teachers to foster students' natural curiosity in a setting that connects them with nature, encourages inquiry, and benefits them across academic and social avenues.

A frequently cited quantitative study illustrated that Environment as an Integrated Context for learning (EIC) programs can have a significant effect on the improvement of standardized test scores as well as students' GPAs across all content areas (Lieberman & Hoody, 1998). Students in the study also showed an improvement in areas of disciplinary actions and

attendance indicating that the benefits of school gardens are not academic alone. Although much of the focus of current research is on curriculum impacts, some address the health and social implications of school gardens as well. "To decrease the threat of the obesity epidemic, children need to broaden their perspective on what foods are edible and to repersonalize food" (Blair, 2009, p. 18). Students involved in the design, planting, and maintenance of a school snack garden were found sampling vegetables they refused to touch before the garden (Canaris, 1995). Students that live in inner city food deserts (having limited access to grocery stores or healthy food options) are now planting, producing *and eating* ingredients for fresh salsa, greens, and salads. Addressing the obesity epidemic of the country through children's lived experiences with healthy foods has shown to, at the very least, interest them in trying a freshly grown veggie (Canaris, 1995).

Gardens provide a direct connection with the environment for students and teachers. A connection with nature is an important factor in determining an individual's amount of environmental awareness. A telephone survey of metropolitan adults reported that childhood gardening was the most important factor of determining an adult's personal value of trees (Blair, 2009). In a time when sustainable living and engagement with the environmental issues of our world are so important, a learning initiative that directly connects students (and teachers) with the natural world can have very important implications. As gardening provides experiences that instill a value of the natural world (trees and all) children may grow up with a greater connection to their environment and a mind towards sustainability. "Nature teaches her children to pay attention to the world around them, to respect what they cannot control and to embrace the creativity with which life sustains itself" (Williams & Brown, 2012 p. 176).

Thorp and Townsend (2001) reported foundational findings of the academic and developmental effects of gardens and stated, "Something significant occurs between plants and people that cannot be captured with quantitative evaluation alone" (p. 348). To further understand the impact of gardens on schooling, they suggest a constructivist approach to the research of school gardens that focuses on the lived experiences of both students and teachers. A deeper understanding of the garden can be found in the stories that teachers and students tell; their stories can add to the existing knowledge base of school gardens.

Significance

According to the U.S. Census Bureau, 83.7% of the population lives in metropolitan areas (2011). Living in these "concrete jungles" limits a child's innate tendency and ability to seek out and explore the natural world around them. School gardening has become a movement spanning the last 20 years that aims to reconnect children to their natural world by providing meaningful learning opportunities (Blair, 2009). Kahn suggested that transformative learning processes that occur in nature should be encouraged and incorporated into the school curriculum, fostering students' natural fascination with nature (as cited in Thorp & Townsend, 2001). Thoughtfully designed and implemented school gardens not only provide real and natural learning opportunities for children but also have some restorative psychological affects. A school garden provides the opportunity for a new type of positive recognition as the community, media and others become engaged with the successes of the school garden (Thorp & Townsend,

2001). However, these benefits will only be obtained when classroom learning is integrated into the natural learning that occurs in the outdoor environment (Palmberg & Kuru, 2000).

Public schools in the United States are driven by a back to basics push that holds students to high levels of accountability on state and national standardized tests, "Accountability is big! Our product is our test scores" (Thorp & Townsend, 2001 p. 353). Although studies are limited and many are narrowly focused, a common theme of research of learning impacts of school gardening follows a positive trend (Blair, 2009). Even with a positive research base for school gardening, school district administrators maintain a constant cycle of curriculum reform of classroom teaching (with emphasis on the *classroom*). New curriculum, test prep resources, and a teach-to-the-test mentality accompanies the drive of high stakes testing as the barriers to garden-based instruction's increase. This over-emphasis on fact-based knowledge creates a weakness in students' processing and critical thinking skills (Blair, 2009). The garden stands as an intervention to fact and test-based teaching.

The incorporation of garden-based teaching practices is not easy or second nature. Barriers to teaching in gardens such as lack of time, funding, support and curriculum, as well as lack of teacher training and experience stand in the way of school-based garden teaching (Blair, 2009). The safe, clean, familiar, and contained classroom feels comfortable to teachers. To incorporate outdoor instruction, teachers must become aware of new safety and control risks that place a heightened focus on their pedagogical practice (Foran, 2005). However amidst the roadblocks, 92 North Texas elementary schools include a garden on their campus and teachers are successfully using the gardens to integrate learning (REAL school gardens, 2013).

For individual change, criteria must be met: The opportunity must appear unique, the teacher must have a sensorial interaction with the process (not just conceptually understand the change), and the change must be perceived as significant to the individual (Greensfeld & Elkad-Lehman, 2006). The passing of time does not provide the framework for change. To adopt this new pedagogical practice, teachers must find importance and value in the garden. There must be an acceptance of the need for nature-based inquiry in the curriculum. It seems a shift in thinking, habit, and practice has to occur.

The significance of this change in teaching appears amidst the teacher's experiences with students. Taking students outdoors is not a common educational practice. A connection between teacher and students blooms when the stale, four walls are removed and students hold in their hands an intense, surprising and direct experience (Foran, 2005). Teachers who are confident in the importance of exploration in real learning find a perfect match for their teaching philosophy and the school garden. They find the garden as a tool to break the isolation of disciplinary boundaries (Thorp & Townsend, 2001). Teachers who take their teaching outside find that it offers much more than a novel space to teach. They are able to directly link occurrences in nature with students' out-of-school experiences, they find feelings of value and identity, their way of "being-in-the-world", and an intense pedagogic relationship with students (Foran, 2005, p. 161).

Much of the research that incorporates learning in and about the environment shies away from standards-based outcomes and investigates the effect of student perceptions of the

environment and environmental problems (Blair, 2009; Williams & Brown, 2012). Studies that have addressed the teaching component of school gardens or the environment as an integrated context of teaching have identified several barriers that teachers must first overcome to feel successful (Blair, 2009; Foran, 2005). Some studies offer suggestions regarding what schools must accomplish to make a school garden successful (Foran, 2005; Thorp & Townsend, 2001). However, few have identified what teachers are doing that works.

Method

I come to this research as an educator, passionate about the integration of the outdoor environment into classroom teaching. As an alternatively certified teacher, I began my career in a school with a garden and a partnership with educators who were passionate about outdoor teaching. The professional development workshops I attended (and eventually led) all revolved around incorporating what was happening in the natural space on our school grounds into what was required of me in the classroom. The experiences of those early years inspired creativity in my teaching as I sought to integrate our garden into my students' classroom experience. This molded me as an educator. The incorporation of our schoolyard into my classroom teaching informed my students of what their place and their environment was really all about.

This stance as an educator, driven to include the outdoor space in my teaching, is what encourages me to research the experiences of other educators like me, and of those who are not. I question what creates the desire/ability/skill/passion/artisanship that allows for an educator to freely choose the outdoors as a classroom tool. What are the opportunities, experiences, vision, and/or disposition that these teachers may share? To begin to better understand this, I felt it best to look at the roots of my questions, the teachers themselves.

Participants

The stories of John, Debra, and Sophia (pseudonyms) come from individual, semi-structured interviews conducted at each participant's school in February of 2012 (see Appendix A). The teachers shared with me their narrative, their experience of arriving and learning to teach at a school with a garden as they responded to my questions and provided anecdotes of their own. Debra is a science content specialist at a public urban school in North Texas where she used to teach fifth grade science. John now teaches fifth grade math in the same school district as Debra. Sophia currently works as a literacy specialist at a small private school but began teaching in a garden at a public school in the same urban area. All three campuses have partnerships with REAL School Gardens, which provides not only garden design and installation but also teacher professional development (see Appendix B). The partnership with REAL School Gardens was not explicitly investigated for this research. The partnership was important as a recruitment tool for gathering participants, but investigation into the benefit or relative importance of the partnership was not a key component of the research with these three teachers.

I transcribed each interview and broke down the participants' narratives into meaningful data pieces. These varied from two to three word phrases, two to three sentences, or a complete story of experience told by the participants. Dividing their narratives into these small pieces allowed for me to create a collage that began to describe their experiences as a whole. I sorted and coded the data pieces manually multiple times before finally arranging the participants'

stories into groupings that described their beginnings and backgrounds regarding the outdoors, what they found difficult about teaching in the schoolyard, what encouraged or inspired them to teach in the schoolyard, and their thoughts on changes in teaching practice.

Through qualitative analysis of my participants' transcribed interviews, I was able to begin to create a collective story that gathered the individual voices of my research participants into a layered story of the experience of these three educators. The layering of the participants' stories provides multiple perspectives of the event of teaching in a school garden blended with my re-storying of their account (Ely, Vinz, Downing, & Anzul, 1997). The first person voices provided here are a result of their narratives woven in to my analysis and interpretation. There is a level of subjectivity in my re-telling; however, I worked diligently to stay true to my participants as I relate their stories. I inserted myself into their story, with the hope of giving them voice (Connelly & Clandinin, 1990). To ensure the story remained true to my participants voices, member checking was used with each participant.

Stories and Restorying

In the beginning

Sophia: *Growing up I was always outside. It wasn't much of a choice! My mom is a wonderful gardener, my sisters and I were always out there. Playing, exploring, learning to be comfortable outside.*

John: *I grew up always playing outside. Behind my house was a small forested area that we were always exploring, building forts, tree houses, whatever. In the summer, we'd go to my grandparent's farm for a couple weeks where we'd fish, hunt, ride horses. I use those stories with my kids a lot.*

Debra: *I was raised outside! My family is in landscaping, I was always out with them. That makes me a little more country, not like some other people who were raised in the city. I learned a lot just being outside. You just can't learn some of that stuff if you don't ever have the experience! Milking a cow, growing vegetables, dig in the dirt, you've got to do it to learn it! But I lived it, so when I got here three years ago and saw this garden I thought it was wonderful. What an experience!*

Sophia: *Seven years ago, when I started at my last school the garden was very different than it is now. There were a few beds, a labyrinth, some herbs, but nothing like now. Classes weren't really using the space for much. A few teachers had some beds they planted but we weren't really teaching outside.*

John: *The garden was pretty established when I came five years ago. I thought it was a pretty cool idea, but wasn't really sure what to do with it. I knew kids would love it, and I knew there must have been ways to use it to engage them. But I had no idea how to get them out there and manage the whole outdoor learning thing. I didn't know how I would use it.*

Sophia: *It took some experience for me to begin to see how to utilize the garden. I came to my second graders after teaching high school, and my expectations for their writing skills were not quite aligned. I kept expecting these amazing writings from my kids, and I just wasn't getting it. I realized, they didn't have the experiences I needed them to have to write! So I started bringing things into my classroom. I brought pets (six of them!) and plants to our room. I was bringing the outside in. But, what happened is my kids started having experiences with those natural things and they started to write better! I started to realize there was something about those natural experiences that affected my kids in a good way.*

John, Sophia, and Debra all spoke of an excitement surrounding the garden. They knew that there is potential there, but for the most part, a little unsure how to uncap it. In case studies of school garden projects, Brynjegard (2001) reported similar enthusiasm from teachers first beginning work in gardens, looking forward to the new opportunity where they would be working with an expert to guide the activity. Carrier's (2009) experience with her pre-service teachers highlighted a potential area for the hesitation teachers may feel as they approach outdoor learning opportunities when her participants reported "they were uncomfortable about the outdoor setting as a location for learning since most had no experience with learning outside of a traditional classroom" (p. 37). The teachers' excitement regarding the opportunity may stem from their connection to the outdoors as children, or it could be a result of their desire to be innovative in their teaching, using the opportunities available to their students.

Standing in the Way

Debra: *It's not easy though, getting the kids outside. Especially now that I don't have my own class. I just don't have the time. I see the third, fourth and fifth graders, but for about 45 minutes and that just isn't long enough to get outside and really do anything. Before, when I had my classes for 90 minutes a day I could get them out there twice a week and do things like pull up the weeds and get things planted. But now, this year I can barely get out there! I can't get out there with students to keep up with the weeds, re-plant what the summer killed, just keeping up is hard. Plus, with the vandalism, it just makes it harder. I try to get the fifth graders out, and hopefully after testing is done we can all get out there a bit more. I've tried to encourage the other teachers, but they're concerned with their curriculum, and their time limits (45 minutes for math, 45 minutes for reading, and so on).*

John: *Time isn't much of a problem for me, but connecting my curriculum to the garden is where I struggle. I know how to get them outside for measurement and geometry, but what about my other objectives? I don't want to just take them out to take them out, I want it to be meaningful. If I were a science teacher, I think it would be easier. It would be really helpful to have some more professional development on math topics to teach outdoors. I'm always open to learning more techniques but I feel like there either aren't a lot of PD opportunities out there or I just don't know about them. I wish there were more.*

Sophia: *I think management stands in a lot of teachers' way. That classroom management was the key to success for me. The reality is that when our kids went outside it was playground time. So we had to work on that management and establish some things. I just took the basics of the classroom and used them outside. Once we had that set, we figured our way through the materials we needed and everything just started to fall into place.*

John: *In my first couple years, it was the classroom management that made it hard though. At first, I thought I could just take them out and they would behave because they're going to want to be outside. They'll listen to me; they'll behave and do what they're supposed to do. Well, that didn't work. Now, after watching and learning from the others here that teach outside so well, I've learned that you have to set some ground rules. My mentor teacher my first year used,* Learn something, Have fun, and Respect all things, *and I still use those today. Short, sweet and to the point. But I wouldn't have gotten as comfortable as I am now without having those examples that I've had to show me how to get these kids outside and engage them and help them learn. What I've noticed though, is learning to be comfortable with my classes outside, mastering that management piece has affected how I teach in the classroom too.*

Debra: *Management is important. You have to know who you are taking out there with you. If you have a really good class, you can feel comfortable handing them a trowel and letting them get to work. Curriculum makes it hard too, although it shouldn't. Our district's curriculum framework has outdoor lessons built into it, but we still don't seem to be getting the kids out as much as I'd like. Maybe once the testing is over and teachers feel like they have more flexibility they will come out.*

Not surprisingly, John, Sophia, and Debra reported similar barriers to outdoor teaching that multiple researchers have found. Time and teacher knowledge as barriers stand out in research by Blair (2009), Greensfeld and Elkad-Lehman (2007), and Murakami, Stuart, Witzig, and Waldron (2012). Additional barriers noted by Blair (2009) include funding as well as curricular links to standards, and a lack of teacher training. Bryjengard's (2001) case studies attributed some of the difficulties she witnessed to a lack of whole school involvement. She noted that vandalism, which Debra reported experiencing, can be reduced as the school takes ownership in the garden. Students take pride in their place. When the garden responsibilities are left to a sole teacher, the task can be overwhelming and among the additional pressures teachers face, garden maintenance can fall to a low priority.

The professional development that John craves also shows again as a teacher need in the research. Resources such as training focused on curriculum connections to garden content, curriculum materials, and specific lessons could aid teachers in incorporating the garden into their teaching (Greensfeld & Elkad-Lehman, 2006). Tal and Morag (2009) put stress on teacher training programs to include areas of outdoor teaching as part of the teacher training process. The pedagogical considerations of teaching outdoors are rarely addressed in teacher training programs where teachers' only passively experience outdoor learning or teaching.

Teachers show concern for classroom (or should I say outdoor classroom) management. The increase in risk and number of distractors makes teaching outdoors especially difficult without a strong pedagogic relationship between teacher and students. As John learned, setting those expectations and standards for behavior clearly and early helped make the learning accessible and meaningful when his classes are outside. Sophia makes the point with her students when she extends the rules of the classroom beyond the four walls. Debra's careful attention to *who* she is taking outdoors speaks to the reality of the classroom teacher and knowing your students and what they need to be successful.

Getting outside

Debra: *I came to this school because they needed their kids to pass the science test. And testing, unfortunately, seems to be what it's all about. Meeting those standards. But there are standards in our curriculum that the garden can teach.*

John: *I think about that too, the standards. We have a pretty set curriculum. But I take those standards and I try to think, how can I engage these kids more by using the garden? I can take ideas I've watched others use and tweak it to meet my students' needs. I take them out and we look at geometry, parallel, intersecting lines, angles. I use our picnic tables and set up class right out there. It's amazing the things they see out there! Many times a student will notice something I hadn't even thought about yet. Even my kids that struggle in the classroom manage to surprise me out here. It's also pretty easy to use the garden to teach area, perimeter, and*

estimation. Those are pretty standard uses for me. Teaching just math, it's hard for me to come up with ways to use the space like I think it would be if I taught science.

Sophia: *In those first couple of years my lessons in the garden came straight from the science textbook. I wanted to extend what my students were experiencing, help them to see the real life connections that happened out there. So as I planned, if something could be done outside, we did it.*

Debra: *When I taught just fifth grade science, I was able to take them outside all the time. We'd go out, buckets and trowels in hand, ready to pull weeds and plant. These kids don't know how to pull weeds! But they love it once you teach them. Plus, I can use what we plant (and what creeps in on its own) to teach about all kinds of things. We plant sunflowers and then they realize where those seeds they eat come from. Planting and harvesting their own vegetables is new to most of them, and they love to eat what they grow! They can watch a bee pollinate a flower and follow that same flower through its whole life cycle. They can experience the life cycles of butterflies and other insects when they discover a chrysalis on a plant or a group of eggs hiding on a leaf. Living and non-living is an automatic investigation in the garden, learning about what living things need. I can bring them out here and I can almost guarantee I'll find something to teach.*

Sophia: *Kids ask questions, you know? And I found out that as I just answered their questions, the learning process stopped. I think it's like that a lot in our traditional classrooms. A student asks a question, teacher answers, now get back to work (or at least look like it). When I started asking the kids questions back, their learning got deeper. They wanted to know so much about the things we were seeing outside, and if I just told them it killed their curiosity and their creativity. I started to use that to help their writing. We'd be out there, they would make observations and write. And we looked busy, so everyone was okay with it.*

John: *A lot of the times I find myself out here happen on a whim. I've done a lesson with one of my classes and I need to grab their attention a bit more, so I take the next group outside. Or, if something is going on that just makes me think going outside would be better. Like, in my second year when I was still teaching English, I took my class out there for a writing exercise. It was one of those days that just wasn't a good day. The kids were acting crazy and it just seemed like nothing was getting accomplished. So instead of just getting upset and being super strict, I just decided to pack up and go outside. I told them to find a rock, find a place, sit down and just write. And reading over those papers the next day I realized it was some of the best writing the kids had ever done. I don't know exactly why, but I just told them to write about whatever you want. Just write.*

These three teachers' perceive the standards as both supportive of using the schoolyard for teaching as well as a barrier. In environmental sciences alone there are a multitude of opportunities including nutrient cycling, water cycles, life cycles, as well as ecological awareness (Carrier, 2009). As Debra reported, she can easily see the content that is waiting to be taught in the garden. Sophia allows the students questions to guide their investigations as she trusts in the ability of the outdoor learning environment to connect with what her students need to learn. However, this deep connection to the standards of testing requirements can stifle the outdoor educator as well. John, as a math teacher, reported being sort of boxed in by the standards he must teach and connections he feels the outdoors can easily provide.

This firm tie to specific content is not unusual in educators, especially in schools where learning is departmentalized. Sophia did not report having as many problems using a cross-disciplinary method in the garden where she is responsible for each content area for her students. Pre-service teachers working in a FISHH (Foods, Investigations, Soils and Healthy Habits) science education experience reported having some difficulty transferring between content applications. Students whose content specialty was chemistry had hard times making the connections to soil chemistry and applied agricultural sciences. The researchers of the project attributed this disconnect to the riskiness of dissolving content boundaries in the classroom due to high stakes testing and accountability (Murakami, et al., 2012).

The firm grasp of scripted curriculum, high stakes testing, and accountability may be what is holding many teachers back when it comes to teaching in the environment. A participant teacher in Foran's (2005) research suggested the staleness of the four walls stifles the students, removing the pencil and paper from the students' learning allows them to be surprised, creates teachable moments from the intensity of the experience, which is no longer abstract like it is in a textbook. When teachers can let go of their norms for neatness, bringing in the children's imagination to their learning experience, the opportunities of the school garden and surrounding environment abound (Blair, 2009).

Making a change

Sophia: *The curriculum used to guide what I taught pretty strictly, not just in the classroom but also outside. We went out if a lesson talked about it or we used the natural things in our classroom as part of our experience. I said we had pets in our classroom, one of them was a tarantula. One morning, we came in and the kids started doing their morning routine of checking on the animals and plants, giving them what they needed and recording their observations while I took roll and got ready for the day. Well, one of my students came up to me in a panic, "Ms. Sophia! We have two tarantulas in our cage!" I said, "Okay, just write it down and check it out." That froze her. "NO! Ms. Sophia! We have TWO tarantulas in our cage!" As I tried not to get frustrated by the distraction, I told her to go write it down again. "Ms. Sophia, please come over here and look, we have TWO tarantulas in our terrarium." So I gave in, walked over and looked and said, "Oh! We have two tarantulas in our terrarium!" And we did! There was a dead looking smaller one and a much larger tarantula, different than the one we left the day before.*

Without thinking, I said out loud, "I wonder if somebody else put a tarantula in there and it looks like it killed our tarantula!" The kids freaked! They started coming up with all sorts of ideas, and through the uproar of the class I asked our principal if she knew if anyone had found a tarantula and put it in our tank as I told her what I thought had happened. That sent her on a mission, and the kids were still wild with curiosity. A little while later our garden coordinator came in and whispered to me the research she had done. At this point, the kids are still worked up over the tarantula massacre, so I grab the tank and set it down and had the class make a circle around it.

We spent some time hypothesizing some ideas about what had happened to our pet. Our next step was to conduct a little research, so using the computer lab we tried to find some answers. One of my students found a YouTube video of a tarantula molting. Part of their natural process is they pop the cap on their back and they go through a very grueling process where many don't make it through. So, we learned something, we learned a lot! We spent the whole

morning on that tarantula, I used it for grammar lessons, for reading, subjects-verb agreement. We did everything based on the tarantula. And that day I got grades for everything, and the kids had a fantastic time, were involved and engaged with no behavior issues.

So, from that day forward that's how I treated everything. We divvied out our pets and our plants and started to let the garden inspire us. I didn't always have cool events like that that would spontaneously combust, but using experiences from outdoors we would create questions like that and find our own adventures. The majority of the time we were outside, whether it was hot, cold, or raining.

It wasn't just science that happened outside though. We kind of integrated all of the subjects and gradually were able to take it to where the kids led it. We still had objectives, but we made it cross-curricular. Whatever our unit, we were investigating and we got to spend more and more time outside. So that experience changed me and the way I teach, but that doesn't mean it changed our whole school.

Not until test results started to come in did everyone else start to ask about what we were doing that was different. It wasn't until they had proof on paper that what I did worked that they were interested in how it was happening. So, we got them interested, but nothing happened over night.

Debra: *Other teachers see me out here, they see the Kindergarten teachers out here, but not everyone is going to do it. I think only the teachers who are comfortable with dirt will get out here and do it. The more country they are, the more likely they are to take their kids outside and let them dig around. It's like it is for the kids, they have to experience it to learn it and do it; and if the teachers don't already have those experiences then it's not likely to be in their practice. But, you can't fault them for that.*

Sophia: *I've seen change happen. Not just in the way I teach, but with other teachers as well. We had some teachers who couldn't get from the gym to the building fast enough because it was outdoors. As the school leaders began to see that what I was doing with my students was working, we took advantage of professional development opportunities, we led some of our own, sent teachers on trainings, and we began to see some change. Teachers began to take their students out, maybe just to walk the labyrinth or explore in a line, but those experiences took them to the next step, going at their own pace, and eventually getting outside.*

John: *I hope that change happens. I hope that teachers can see me out here, and the other teachers that get out here a lot, and start to see that it really works, and the kids love it, and they can start to get their classes out too.*

These three teachers have different views on teacher change represented here in their stories. Sophia's experience as a teacher, watching the difference a change in teaching had on her students served as the catalyst for her self-directed change. John experienced mentoring and guidance that now encourages him to be the same for other teachers on his campus, hoping that change can happen for them too. Debra's beliefs about what a teacher needs to be comfortable teaching outside (prior experience in the outdoors) lead her to be more skeptical about teacher change.

The idea of teacher change is a difficult one, especially in the high-stakes testing era of accountability. The fear of failure is so closely tied to the fear of change. Without the training, teachers feel they don't have the abilities to teach in the environment. Those initial accounts of discomfort resonate with Debra's feelings. Without the inclination to teach in a less-structured

way, or the previous experiences of outdoor education, teachers are less inclined to take their teaching outdoors (Murakami et al., 2012). The conversion, the change, of one situation (the four walls of a classroom) into another (the garden, schoolyard, environment) does not necessarily happen in professional development (Greensfeld & Elkad-Lehman, 2006).

Discussion & Implications

When teachers begin to view teaching in the schoolyard as a benefit, as they do in Sophia's story, they begin to place value on the skill. When they can watch their colleagues experience success they are likely to find a way to try the experience themselves (Brynjegard, 2001). As administrators place importance on the skill, they strive to provide new experiences for teachers in the form of professional development or mentoring opportunities like the ones John reported. Teachers who begin to have these experiences will find hesitation and fear transforming into enthusiasm and excitement. Participants in Carrier's (2009) study revealed, "Being out there in the outdoors you can actually show them what you're talking about . . . (It) is also visual, there's auditory, you can hear, you can see. So I really realized that being outside is a way to reach all the kids" (p. 41).

The teacher stories presented here are not unusual. They are stories found throughout the research in garden education. Together, they reveal some insights into using the schoolyard as a component to teaching. Debra's story comes from a school where she feels like the sole provider for the garden. The responsibility is hers, which along with the pressures of science test scores and limited time with students seems like too much sometimes. There is not a feeling of a community of garden educators there. With her busy schedule, wildflowers (some say weeds) have taken over their vegetable beds. Vandalism has destroyed the greenhouse and countless trees. The teachers on her campus do not have the experiences to get them outside, valuing the area, and using it with their students. And, as the research has said, without a framework of experience for those teachers they probably never will make that change.

John's story is different. He came to his school, with its established garden and experienced teachers, as the novice. He was the one lacking experience. Through positive mentoring and role modeling from colleagues, he began to see the value of the garden and using the environment to teach his students. He learned to manage his students outside, to let them "just write" and let their experience inspire their writing. Guided by exposure to professional development, he is able to adapt his own learning experiences into lessons that address the content his students must master to claim success on state standards. His ability, willingness, and confidence to take them outdoors allows them to see things and make connections that he can not provide them in the four walls of his classroom.

Sophia's story seems to stand out. Her story begins in a semi-established garden, a few herb and rose beds, a labyrinth, and plenty of space. She describes her teaching as bringing nature into her classroom, certainly inspired by the environment but not integrated into it. But there was an event, a moment, when her teaching changed: The intense experience of learning that happened with her and her students with the case of the molting tarantula. When her students' engagement with this natural event inspired their curiosity and intent to learn, she had a revelation.

Hey! Why don't we start looking for things outside and taking the kids outside to discover, rather than bringing nature in. Whatever our unit was, we were looking and investigating. And so, at that point we could spend more time out there because we were using more subject time. And so we were still meeting all of our objectives, but we were managing to be outside and experiencing and apply it all at once. We just gradually took it to where the kids led it. We still had an objective; but, it was more incorporated to cross-curricular. (Sophia)

"Subject areas are like members of an ecosystem, coming together to create a whole that is greater than the sum of its parts." (Williams & Brown, 2012, p. 165) Sophia became the catalyst for her school. Her successes sparked the curiosity of her colleagues and administrators. Not only were the students intrigued by outdoor learning, but so was the rest of her campus. The intense experience of the tarantula allowed Sophia to understand her role as teacher in a new way. She became a mentor for other teachers, a leader in professional development on her campus and others, providing those same types of experiences for teachers so they too could find the value of teaching in the garden, allowing the environment to be their guide. The mentoring that Sophia provides and that John experiences creates opportunities for what Rogoff called cognitive apprenticeship (as cited in Jones, Rua, & Carter, 1998). Using Vygotsky's theories of socially negotiated learning, teachers are able to place themselves in an expert-novice relationship and learn new skills and confidences from their colleagues (Jones, Rua, & Carter, 1998).

This "garden pedagogy" exists where the unplanned moment becomes a teachable one. When the garden is the teaching tool, all subject areas become combined through the children's motivation to explore. Aesthetics, culture, and geography are integrated into the core curriculum (Foran, 2005). Teachers act as facilitators rather than conveyors of knowledge. The responsibility of the teacher relies on gained experiences and fostering student inquiry rather than on stored knowledge (Williams & Brown, 2012). This type of teaching requires experiences where teachers begin to understand the value of their environment, trust in the learning process, and feel confident in their ability to guide (Moore, 1995).

A single professional development opportunity may provide a catalyst for change; however, there is no book that can teach a step-by-step guide to garden pedagogy (Williams & Brown, 2012). For the teacher to make the conversion from four walls to the schoolyard, more than a single exposure is needed. The community that John became a part of and the one that Sophia helped to begin may make these transformations more likely. That community of mentors and leaders provides the opportunity for teachers to see successes (and failures) and gain the skills and confidence needed to take their students out, letting nature be their inspiration and their guide.

Future Research

The teacher narratives here illustrate that further research is needed to understand what assists teachers in becoming confident, outdoor instructors. Their shared experiences suggest that mentorship may provide a part of the answer. Further investigation into professional development and teacher training programs that focus on the pedagogical skills necessary for outdoor instruction may also provide new insights.

When teachers are able to touch their teaching, experience it in real life, their understanding seems to emerge like snap peas peeking out of the fresh dirt. Their green tips poking above the nourished and moist earth. Nurtured with care and attention, they stretch and reach for fresh air and sun. In time, leaves unfold, fruit appears, and the peas know.

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Appendix A
Semi-structured interview questions

Open interview format with guiding questions for narrative response

1. How long have you worked at a school with a garden?

2. Talk to me about your initial reaction to the garden as an outdoor classroom.

3. How have your feelings changed regarding the garden and outdoor teaching?

4. Describe some factors or events that influenced your thinking about outdoor teaching.

5. Talk to me about what it was like to learn to teach outdoors.

6. How has your teaching changed because of the outdoor classroom on your campus?

7. What is your experience of working with other teachers on your campus regarding the outdoor classroom?

Appendix B
About REAL School Gardens

REAL School Gardens partners with high-poverty elementary schools to create learning gardens that become an integral part of their teaching culture and community. We support the design and installation of school gardens, train teachers to use them to improve children's learning and build community around them to nurture support for urban schools. When teachers take learning outdoors, children achieve greater success in school by becoming more engaged learners, more effective team members and also healthier people.

In North Texas alone, we support 92 schools, ensuring that more than 50,000 children and over 3,100 educators have daily access to nature through school gardens. Our gardens have been shown to improve children's lives by boosting academic achievement, nurturing healthy lifestyles, cultivating life skills and promoting environmental stewardship.

What makes us different is that our program is grounded in academics and builds community around a child. Parents help children make salsa with their school's chili-pepper harvest. Neighbors lend hands to weeding. Educators discover teachable moments inside a cocoon's silken threads. These collective efforts inspire students to become engaged, active learners, which ultimately develops happier, healthier and smarter children.

Our inclusive approach embraces a shared belief -- that the best way to embed learning into life is to have real-world experiences outdoors. And, as a third-grader so eloquently said, "I like the garden because it is kindness. Good things happen here."

As we forge new friendships in new states, we remain committed to helping schools and communities grow hearts, minds and spirit.

For more information visit: http://www.realschoolgardens.org/