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IN THIS ISSUE

EDITORIAL RESPONSIBILITY

The *IALS Journal* is published once a year and addresses key issues facing today's laboratory and university affiliated schools. Articles offer perspectives on educational trends and include topics such as the history and future of lab schools, innovations in curricula and programs, lab school administration, and teacher education. The journal includes articles grounded in evidence-based classroom practices, action research, and theoretically based quantitative and qualitative scholarship.

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LETTER FROM THE EDITOR

I am pleased to present this twelfth volume of the *International Association of Laboratory Schools Journal*. As the pandemic raged on through the 2021-2022 academic year, the important work of laboratory schools continued. Our members were busy meeting the many demands of professors and master teachers while also consistently navigating changing protocols and procedures from the state. This journal is evidence of the dedication to, not only the field, but to progress as we work to serve our students, community, and field in an ever-evolving world.

In the featured article, "Flexibility During the Pandemic: Creating Opportunities for Inter-Professional Learning Through the Laboratory School," author Eric Kirkman identifies a new process for collaboration discovered throughout the pandemic. Kirkman details his experiences and their implications as he and his colleagues worked to find creative solutions to unique issues through strengthened partnerships during a time of conflict.

Writers Jozwiak and Vera outline the value of our history in their article, "John Dewey and the University Lab School: Lessons Learned and Implications for Today". An interesting account of our founding father, John Dewey, and the development of laboratory schools pivots into an opportunity for lessons learned as we endure change and evolve as an institution.

Working together to facilitate change and growth is the work of Nicolas Ramos in his article titled, "Collaboration, Reflection, and Dialogue: How a Group of Laboratory Schools are Creating a Community of Practice." Ramos inspires as he underlines the value of partnerships and how we, as an organization, can deepen our relationships and impact our work through collaboration.

Laboratory school teacher, Kevin Goodwin, reminds us of the value of student engagement in his piece, "Reflections on Sewing in the Classroom." Goodwin details the benefits of sewing and his procedures while also sharing management strategies perfect for the practitioner.

"Makerspace: Engaging K-12 Learners and Growing a Society of Critical Thinkers and Innovators, A Qualitative Examination," by writers Graf and Malmont provides just one example of the many valuable perspectives that were gained as a result of the pandemic. Graf and Malmont created a framework for engaging students at home during a time of virtual learning while also experimenting in the new makerspace movement.

Our volume also includes, "An Interview with John Goodlad on the Role of Laboratory Schools and the State of American Education" and an excerpt from, "The Laboratory School: Its Rise and Fall?" Both articles were shared in IALS journals of the past and were republished here in the hopes that we can continue to remember and grow from the many challenges that come along with the joy of the laboratory school.

As editor, I am honored to celebrate the work that you do in your laboratory schools, with your colleagues, and for your students each day. I hope that you, too, will consider honoring your outstanding teachers and laboratory schools by submitting your academic research and writing in future volumes of the *IALS Journal*.

Dedicated to research, leadership, and educational excellence,

Ms. Tamara Smith-Moore
2021-2022 Editor

LETTER FROM THE PRESIDENT

Dear Members of the Lab School Community,

As I write this, I find myself riding a rollercoaster of emotions. My school is returning from Spring Break somewhat rested and rejuvenated and filled with hope that the pandemic will be a memory. We are slowly easing our safety measures. Visitors are returning. University students, educators, and family members are once again part of the daily fabric of our lives. But while we welcome the return of everyday routines and treasured experiences, our hearts ache for those displaced, injured, and killed in the war between Ukraine and Russia and many other places in the world. With every smiling face I see entering our building, I say a silent prayer for those who cannot enter their school. And I wonder, how do we help the children under our care to understand the violence in this world? How do we give them the skills to make changes? As experts in the development of children, how do we support their families to navigate these conversations with their children? How do we mentor the teachers who will continue this work and help it spread across schools and communities?

This edition of the IALS journal is dedicated to the ways we stayed true to our missions during the pandemic. The ways relationships and authentic experiences remained at the core of our learning experiences. In navigating the pandemic, we rose to a new challenge that called on us to put kids first, and the same is happening with the Russian invasion of Ukraine. As I read older editions of our journals, I noticed the questions never change; we are always asking what do lab schools stand for? And the answer is always we stand for honoring children, childhood, and learning.

Jill Sarada
President IALS

Flexibility During the Pandemic: Creating Opportunities for Inter-Professional Learning Through the Laboratory School

Eric Kirkman, EdD
UNIVERSITY OF NORTH ALABAMA

Interprofessional Learning

The concept of learners from various fields and backgrounds training alongside fellow interprofessional peers is not new. While these experiences are vital, the Institute of Medicine (IOM) reported that the collaboration between health care professionals and others outside of the healthcare profession is a vital component to the providing of quality care to patients (2015). Green and Johnson (2015) stated that this form of collaboration is a part of one's professional and ethical obligation. Academic institutions, health care organizations, and accrediting bodies are also recognizing the importance of promoting interprofessional collaborations in all settings (Rotz and Duenas, 2016). It is believed to be part of an essential process in preparing preservice educators, nurses, etc. to assume their future professional roles (Jones et al., 2018; Savolainen et al., 2020). This type of collaboration is known as interprofessional education (IPE). During IPE, learners are given an opportunity to learn from, with, and about each other (IOM, 2015). The goals of this experience are to increase knowledge, skills, safety and quality of services offered to clients (Villemure et al., 2019; Stehlik et al., 2018). The Interprofessional Education Collaborative (IPEC) believes that this can be established through a set of core competencies. The competencies include essential skills, ethics, roles and responsibilities, interprofessional communication, and collaborative teamwork across various disciplines of study (IPEC, 2016).

Interprofessional Collaboration at The Laboratory School

The COVID pandemic, which started in the spring of 2020, created many obstacles for individuals and business entities to conduct their "normal" operating procedures. The pandemic also created opportunities for innovation and for learning how to do things differently. Members of the community had to learn how to navigate life under the auspices of mask mandates and closings of businesses, houses of worship, and even schools. At the University of North Alabama, students, faculty and most staff were transitioned to remote or virtual work. Shifts in how classes operated across various departments and pre-professional programs left many instructors scrambling to meet the needs of their students under unprecedented circumstances. As a result, many faculty members were faced with decisions on how to accommodate the course and degree requirements for their programs of study.

One such dilemma was noted in the Anderson College of Nursing and Health Professions (ACONHP) at the University of North Alabama. In the Fall of 2020, the students enrolled in the Pediatric Nursing course at UNA were denied access to the local hospital units due to visitation restrictions implemented as a result of the pandemic. Consequently, those students were not left with any other options to fulfill their pediatric clinical requirements for their course. During this same timeframe, the administrator at Kilby Laboratory School at the University of North Alabama was in the process of finalizing the school's pandemic mitigation procedures for the semester. The two separate needs created a unique opportunity for collaboration and interprofessional engagement between the College of Education and Human Sciences and the College of Nursing and Health Professions.

It was determined that the pediatric students could engage with the Laboratory School students by conducting health assessments with students as they arrive in the mornings during drop-off. The nursing students would receive guidance and practice on how to engage with the students while checking their temperatures and asking basic health assessment questions to ensure students were not sick when they arrived at school. The nursing clinical instructor was always present, and she would conduct a debrief following the drop-off phase of the morning clinicals. The students would have the opportunity to discuss what they learned that morning and reflect on how they could improve their techniques for the next clinical rotation. Many students commented on the value of practicing engaging with not only the students, but their parents as they greeted them each morning. The nursing students learned valuable communication skills as they worked to establish rapport and trust with young children while providing some form of

medical care. The nursing students not only learned how to lower patient and parent anxiety, but they also learned how to properly approach young children with gentleness and care.

In addition to the drop-off clinicals, the nursing students also engaged the Kilby students in educational programs that provided information about the pandemic, as well as, handwashing techniques and other ways to avoid the spreading of germs. These educational clinicals once again provided meaningful educational opportunities for the pre-service nursing students through the utilization of the laboratory school setting as a "practice site" for their pre-service work. The nursing faculty were very appreciative of the partnership, and the education faculty were equally thankful for the added layer of support in mitigating the spread of COVID-19 in the building. It was a valued partnership that provided positive and valuable learning experiences on both sides. More importantly, the experience revealed great potential for future collaborations with not only the nursing department, but with other departments across the University campus.

Future Implications for Interprofessional Collaborations

The implications of this collaboration provide a model to consider as laboratory schools generally are designed to accommodate pre-service educators in training to become teachers. It can be said that the laboratory school can be utilized by other college departments for the purpose of preparing their students for work specific to their field that also engages children through that work. As many laboratory schools exist as "model schools" for educational practices, it is the ambitious presumption that these same laboratory schools can help provide valuable and authentic learning experiences for students in other fields of study through working with children and their master-teachers to provide a bridge-to-practice in their areas of expertise.

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John Dewey and the University Lab School: Lessons Learned and Implications for Today

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Abstract

The work of John Dewey, in establishing The University of Chicago Laboratory School, continues to inform current educational practices and school operation. In this article, contemporary laboratory schools are examined alongside what is known about The University of Chicago Laboratory School under the guidance of John Dewey. The lessons that have endured for almost a century are recognized and the differences are considered in the areas of: demographics of students and families, management and administration of the schools, relationship with the university, staffing, research and community collaboration. In examining the elements of John Dewey's school that endure, contemporary laboratory schools can be better positioned to endure amidst educational change.

Introduction

Across time, philosophical beliefs about how children grow and learn have shaped education reform (Chan, 2004). John Dewey considered philosophical theories and ideas incomplete unless verified through research (Camp-Mayhew, Camp-Edwards, & Dewey, 1936). To develop a place where faculty could think, study and correct "ideas about the continuing development of human beings in knowledge, understanding, and character" (Camp-Mayhew, et. al, 1936, p. 3), Dewey established the University of Chicago Laboratory School. Through the years, the University of Chicago Laboratory School underwent many name changes, such as University Laboratory School, Elementary Laboratory School, and University High School. However, for this article, the term, The Dewey School, as affectionately called by the Camp sisters (Camp-Mayhew, et. al, 1936), will identify the first lab school established by Dr. Dewey. The school provided the impetus for innovations still occurring in the PreK-12 educational arena and influenced the content taught on college and university campuses.

One innovation initiated by Dr. Dewey and continues today involved the project method. Tanner (1997) describes how children start their day with groups of children reflecting on the previous days' work and collaboratively plan goals for the current day. Today, laboratory schools incorporate project approach, as evidenced at the University of Chicago Laboratory School (2019). One example of a primary project involved creating a home for a mischievous bunny, who often escaped. The children decided the bunny escaped because of boredom and after many discussions, the children chose to build playhouses. The teacher, Ms. Gillespie, invited her dad who was a retired architect to speak to the children about creating spaces for clients. After recording observations of the bunny, pairs of children created cardboard buildings at a designated area for creating projects at the university laboratory school. Once created, the bunny experienced each playhouse, while children observed what features in the house the bunny enjoyed. Together, the children solved problems to create an engaging environment for the bunny, while simultaneously developing the skill of observation. The University of Chicago Laboratory School continues to implement the curriculum Dewey advocated at the Dewey School to encourage investigations, discovery, and collaborations.

Before looking at more characteristics of The Dewey School, it is important to understand the historical background of schooling in this period. Education in the late 1800s and early 1900s included memorization of materials, few textbooks, and firm discipline often involving punishment. Urban schools separated children by grade level, but rural schools involved one-room schools with all grade levels working together. Children in cities often worked in the mines or factories doing any job to help support their family. Children residing in rural areas worked on the farm after school and usually late into the night. Society was changing with an influx of immigrants, an increase in factories, and public education gaining importance (Wortham, 2002). According to Wortham (2002), progressive philosophy "was an effort to use the schools to meet the needs of an evolving urban-industrial society" (p. 15). The Progressive education movement often is associated with John Dewey but originated with Colonel Francis Parker. However, Dr. Dewey believed in the philosophy and included it in The Dewey School.

The purpose of the Dewey School focused on developing democratic ideals of the children while at the same time

learning cooperative and shared skills. It promoted the idea that schools should develop citizens ready to serve in a democracy; thus, able to think critically, solve problems scientifically, and work collaboratively to improve society. Education should develop students' future occupations, emulate the home, and prepare students for life after school. Each of these ideas was foreign to the culture of the late 1800s since school attendance was not compulsory, and children often followed their parent's occupations (Wortham, 2002). Further, since the United States economy and society were experiencing immense change, Dewey and others believed, education should serve the foundational democratic principles. Dewey's beliefs in this "educational change" (Wortham, 2002, p. 16) motivated the establishment of The Dewey School and subsequent development of the curriculum.

According to De Pencier (1967), some basic principles guided the instructional decisions of the Dewey School. First, the school would imitate the home by exposing children to various home occupations for two reasons. Dewey believed home occupations resembled activities similar to all children and applied easily to core subject knowledge. For example, when teachers integrated cooking, sewing, and woodworking projects into the content as children applied their understanding of mathematics, physics and chemistry into daily home tasks. When measuring wood while building wooden projects, children understood mathematical concepts and when cooking, children observed chemical changes in liquids and solids.

Another principle involved the children learning how to collaborate with others so that school was more than a place to attain knowledge. Dewey's school developed dispositions such as responsibility, respecting others, and working together to achieve a common goal. Dewey believed that education included more than rote learning. Instead, it required discovering solutions through experimentation to develop a foundation and appreciation for knowledge and the collaborative nature of the work developed interpersonal and emotional skills of the children (De Pencier, 1967).

Additionally, through this experimentation, children engaged in problem-solving activities for hours, so there was little need for behavior incentives, management techniques, or classroom rules. The investigations that children were involved with provided the impetus for their self-control. Further, the discovery curriculum matched a child's developmental and personal interests, with the teachers interested in developing the whole child rather than focusing on transmitting academic content alone. Last, the practices of The Dewey School hoped to result in continuity of learning for each child by using previous knowledge and identifying gaps while developing the child's knowledge base (De Pencier, 1967).

The practices of The Dewey School, including the innovation of a discovery curriculum and the continuity of the home and school, transformed pedagogic decisions both at The Dewey School and currently at institutions serving students from PK-12. Additionally, the idea of utilizing a university environment as the setting for research inspired institutions of higher learning to mimic the innovation of Dewey; thus, the concept of a university lab school emerged. According to Cassidy and Sanders (2002), 212 university laboratory schools existed in 1964. However, declines began in 1973 and continued to 2001. Currently, the International Association for Laboratory Schools website identifies over 100 existing university laboratory schools (2019). Scholars identify challenges university laboratory schools face and how administration continues to reinvent themselves amid a changing university landscape (Barbour & McBride, 2017; Sparks, 2015).

The impetus for changes began occurring in the '70s and resulted from the critiques in the Coleman Report of 1966 (Wortham, 2002). By the mid-1970s, schools had not been able to improve education, and financial sources became limited. Thereafter, the commission's report, *A Nation at Risk*, in 1983, further described the problems of our educational system (United States Department of Education, 1983). The report generated interest in solving the educational problems through government interventions. The subsequent interventions included initiatives such as Title 1, Reading First, English Language Learners, Individuals with Disabilities, and No Child Left Behind. Each reform involved following government requirements to receive additional funding (United States Department of Education, 2005). Even though there is not a distinct connection between the decline in laboratory schools and the increase in governmental interventions, it is interesting to note the link and pose questions about possible challenges affecting the sustainability of contemporary university laboratory schools.

Both the Dewey School and contemporary laboratory schools have incurred challenges as they attempted to sustain themselves amidst political and economic changes occurring within society. By comparing and contrasting The Dewey School and contemporary laboratory schools, we can extract lessons learned and help sustain laboratory schools. The following paragraphs will describe the methodology of this study.

Methodology

The findings and conclusions shared in this paper evolved from an earlier study seeking to research how university laboratory schools sustain themselves amid changes in society and the university. The study identified university laboratory schools operating for at least 80 years and then attempted to understand the sustainability factors within the oldest laboratory schools (Jozwiak & Vera, 2016). This article utilizes a Document Analysis approach focusing on "research-generated documents" (Ary, Jacobs, Sorensen, & Walker, 2014, p. 472) comparing research about contemporary laboratory schools (Jozwiak & Vera, 2016) with the Dewey School. Primary sources included the research on the contemporary laboratory school and journal articles by Dewey and by teachers at The Dewey School. The remainder of the documents about the Dewey school involved analyzing historical research and viewpoints about The Dewey School. Further, this article examines what we can learn from The Dewey School for future laboratory schools and any endeavors with school-university partnerships.

To understand contemporary laboratory schools, the researchers developed a comprehensive list using databases, professional contacts, and search engine results. Investigators sorted the contemporary laboratory schools by the amount of time in operation. The researchers identified schools both in the private and public realm that have been in operation for over 80 years. The investigators removed any laboratory schools who experienced significant changes over the 80 years and contacted administrators to participate (Jozwiak & Vera, 2016).

From this list, ten schools chose to participate in the semi-structured interviews. Researchers interviewed lab school representatives about the mission, enrollment, demographics, administration, funding, and research at the laboratory school. Researchers recorded, transcribed, and analyzed interview data into categories and commonalities (Creswell, 2007).

This article compares the data from the oldest and most successful lab schools to the Dewey School to identify lessons for lab schools of today to consider. The following paragraphs will identify characteristics of The Dewey Laboratory School described in documents authored by John Dewey, his colleagues and from historians who have researched Dr. Dewey and the school compared to the oldest university schools in existence, hereafter, called contemporary laboratory schools. The analysis identifies similarities between the two times to gain knowledge on lessons learned from history. In doing so, the contemporary laboratory school understands how to challenge government initiatives currently impeding the progress of education in public schools and to propose, test and provide research-based evidence of innovative solutions to existing challenges faced by PK-12 education.

Demographics of Student / Families

In 1898, The Dewey School was located in the Hyde Park - Kenwood area of Chicago where middle to high socioeconomic level families lived. During the 1898-99 academic year, 60 children attended school on Ellis Avenue (Camp-Mayhew et al., 1936). Educated professionals lived in the neighborhood surrounding The Dewey School, and according to De Pencier (1967), families discussed issues related to changes occurring within society, such as immigration and industrialization. In reaction to changes happening in American culture, the teachers and Dr. Dewey reflected on how to adjust their pedagogic practices and how to engage families to understand societal inequities and transformations (Wortham, 2002).

One such change discussed in social and scholarly circles included child labor versus the importance of school attendance (Wortham, 2002). Dewey's school emphasized the importance of school attendance and created a climate that encouraged learning with a wide age range of children, age 4-high school, who attended daily. The school limited class size, thereby lowering the teacher/student ratio and thus, providing small groups for instruction. With the lower class size and more attention given to individual students, students experienced more success and attendance increased. Another incentive for attendance was the prestige that was associated with being able to pay for private school, however this simultaneously resulted in fewer economically diverse students enrolled at the Dewey School (Tanner, 1997).

While Dewey did not voice concern regarding a lack of diversity, contemporary laboratory schools struggle with the issue of diversity and the impact it has on research and funding. Seventy percent of the contemporary laboratory schools claimed at least one aspect of diversity within the populations served, which included diverse abilities, cultural, linguistic, or economic differences. Of that 70%, 10% accomplished diversity in all areas. Laboratory schools struggle with achieving diversity in student enrollment, not only because of the economic impact on the program but also because many schools utilized random selection and lottery for admissions (Jozwiak & Vera, 2016). However, according to the National Center for Educational Statistics (2017), Latinx students increased from 16% to 25% during 2000-2015 with White students decreasing (62% to 49%) (Musu-Gillette, de Brey, McFarland, Hussar, Sonnenberg, & Wilkinson-Flicker, 2017).

The National Education Association (Litvinov, Alvarez, Long & Walker, 2018), identified ten challenges associated with public education, one of which involved diversity. According to Litvinov et al. (2018), public schools today struggled with assisting undocumented immigrants. Political decisions affected immigrant children of all ages such that lives are in an undetermined state contributing to absenteeism, lack of engagement and future decisions. Although diversity for university laboratory schools is related to funding and

research, laboratory schools should consider how to address this challenge whether through research, enrollment, or assistance to students and their families.

Management / Administration / Staff

Another aspect to understand about both The Dewey School and contemporary laboratory schools involved the personnel working in administration and the classroom. After carefully calculating whom to select for leadership roles in the school, Dewey asked Ella Flagg Young to join the administration team. Dewey also hired Georgia Bacon as Supervisor of Instruction, Katherine Camp as Director of Curriculum and Laura Runyon as Dean of Students (Knoll, 2014). For the initial six-weeks of school, Dewey asked teachers to observe and reflect on the children and the curriculum to determine the educational choices that encourage success. Additionally, planning was flexible, continuous, and aligned with the child's development, home life, and personal culture. The fluidity of the curriculum required highly qualified teachers.

Along with Dewey's teachers emphasizing flexibility in their planning, Dewey managed the lab school with less organizational structure than schools today. Fallace and Fantozzi (2017) identified several complaints from observers about the implementation of the Dewey School as "lacking direction" (p. 5). Alternately, Tanner described Dewey's administrative organization as "organic" in contrast to "mechanistic" (1997, p. 96) management. The mechanistic leadership style focuses on rules and decisions made from the top down using detailed tasks for individuals and a formal atmosphere. Organic organization involves relaxing of lists and rules, cross-communication among groups, decisions subject to change, and an emphasis on teamwork (Lunenburg & Lunenburg, 2012). Teachers at his school thrived within Dewey's organic approach to management and organization. Dewey continued learning about how to manage schools, train teachers and develop teaching skills from individuals with similar philosophies.

Ella Flagg Young influenced Dr. Dewey's philosophy about teachers and teaching. Young, a University of Chicago faculty member, believed the role of an administrator was to "facilitate not fetter" (Tanner, 1997, p. 103) teachers. According to Tanner (1997), the University Laboratory School valued the knowledge teachers attained from their practice. Young believed equality should exist in education in the areas of gender and pedagogy (Lagemann, 1996). Young, also a student of Dewey, wrote about teacher advocacy, and, according to Lagemann, inspired parts of Dewey's Democracy in Education. Dewey's beliefs about providing an atmosphere of support for teachers circled back to Ella Flagg Young. As his Supervisor of Instruction and former graduate student, Dewey respected teachers and administrators who challenged the status quo and who valued education.

Dr. Dewey chose administrators who believed in his philosophy, achieved a college degree, and held outstanding previous experiences in education, but few attained faculty status at a university. Branscomb and McBride (2005) affirm the importance of having tenure track faculty with administrative roles in laboratory schools. However, only twenty percent of the contemporary laboratory schools described their administrators as tenure-track or clinical faculty. The remaining administrators from today's oldest laboratory schools held the title of principal or director and reported to the university dean or administrator associated with the college.

Another difference in the administration of contemporary laboratory schools and The Dewey School involved governmental mandates. Existing laboratory schools have faced the standardization in education that challenges public schools (Litvinov et al., 2018). Many lab schools resisted the pressures of mandated standards and testing by remaining independent, choosing to form a charter school instead of collaborating with a public school. Through these choices, some laboratory schools preserved autonomy in school curriculum, thus allowing teacher and administrator flexibility to employ researched-based practices and curricular innovation.

Relationship with the University

Both contemporary schools and The Dewey School reside in a university setting; however, there are some differences in the relationship with their respective university. The Dewey School (Camp Mayhew et al., 1936), first entitled University Elementary School in 1899, originated in the Department of Education at the University of Chicago (Knoll, 2014). The name changed in 1901 to Laboratory School and continued to operate in the Department of Education at the University of Chicago. At this time, Alice Dewey assumed the role of principal and John Dewey continued as the administrator of the school while also serving as faculty at the university (De Pencier, 1967). The Dewey School focused on pedagogic experimentation within the Department of Philosophy (De Pencier, 1967).

In contrast to The Dewey School, 70% of the contemporary laboratory schools reside in the College of Education at the undergraduate or graduate level. Colleges of Human Sciences and College of Family Studies held the remaining thirty percent of contemporary laboratory schools. Regardless of their college affiliation, some teachers in contemporary laboratory schools served as adjunct faculty for their respective colleges (Jozwiak & Vera, 2016).

Teachers

Both The Dewey School and contemporary laboratory schools employ teachers, but each has a distinct difference in credentials and requirements. The Dewey School opened its doors in January of 1896 with sixteen students and two teachers. The school increased enrollment to 140 students, twenty-three teachers, and ten assistants. Dewey believed that teaching included education from an institution of higher learning, which focused on scientific exploration (Knoll, 2014). Secondly, Dewey hired teachers who had experience with children and possessed dispositions such as organization, calmness, and social sensitivity. Lastly, Dewey focused on the intelligence teacher candidates exhibited and in their ability to relate specific concepts to more abstract generalizations about the same subject (Durst, 2010a).

Along with rating abilities and dispositions of future teacher employees, Dr. Dewey required specific credentials from his teachers. Dewey hired teachers who had experiences in a university setting or had recommendations from other higher education institutions. Initially, Dewey chose teachers with interdisciplinary coursework until he realized a discipline-specific focus on science or math aligned better with his curriculum (Tanner, 1997). For example, Katherine Camp, a University of Michigan graduate and who worked at the Pratt Institute, taught science (Durst, 2010a, Durst, 2010b). While attending the University of Michigan, Katherine, and her sister, Anna, met the Dewey family (Durst, 2010b). Anna Camp studied history in Cleveland, Ohio and worked at The Dewey School until she accepted a position as a tutor for the Crane family, who supported The Dewey School financially. Althea Harmer, a Pratt Institute graduate, taught and mentored by Katherine, joined the teachers at The Dewey School. Her course of study consisted of domestic sciences such as sewing, design, drawing, biology, chemistry, and physics, but her primary focus for The Dewey School involved textiles. The study of textiles conjures ideas of aesthetics related to dressing. However, according to Pan (2017), the science of textiles involves testing flexibility, absorbency, and even warmth of fibers, thus involving physics and mathematics. Mary Hill graduated from college with an emphasis on chemistry and biology. Given the credentials of these teachers, all attained extraordinary achievements of graduating from higher education institutes, which few women achieved in the late 1890s. Each teacher arrived at The Dewey School understanding and able to employ the scientific method to expand on Dr. Dewey's philosophy (Durst, 2010a).

Dewey's first teachers participated in scientific discovery while working side by side with Dewey, testing ideas, gathering data, publishing results, and revising their teaching (Durst, 2010a). Katharine Andrews Healy, a teacher at The Dewey School, described this process as one where Dewey expected the teachers to reflect on the teaching process, identify questions for research, and discover answers to their inquiries. Dewey persuaded President Harper to allow Dewey's teachers to publish articles on their research. In correspondence to Harper, Dewey emphatically declared that laboratory schools existed to investigate and to develop research (Durst, 2010a). The articles by Camp-Mayhew et al. (1936) and others (Durst, 2010a; Harmer, 1904) confirmed the focus of Dr. Dewey on his teachers writing and publishing their findings. However, some teachers, Laura Runyon (as cited by Durst, 2010b) believed the work they accomplished at the school was viewed as less relevant to the outside world than the achievements of Dr. Dewey.

De Pencier (1967) and Durst (2010a) disagreed with the thoughts of these teachers. Instead, De Pencier and Durst believed The Dewey School teachers influenced the community. According to De Pencier (1967), teachers at the laboratory school valued the principles of The Dewey School and often defended their teaching to the outside world. The teachers devoted themselves to developing and furthering the Dewey principles, whether through participating in social justice issues or writing articles about their research in the classroom (Durst 2010a).

In contrast to the teachers at The Dewey School, contemporary laboratory schools explained that few teachers at the university laboratory schools participated in developing research. Only one administrator shared that she actively seeks research agendas from teachers. Only twenty percent of schools identified any participation by teachers in their own research projects or external research projects. Research agendas in contemporary laboratory schools typically move from the university researcher inward to the school where the research is conducted (Jozwiak& Vera, 2016). File (2012) and McBride et. al. (2012) identified the significance of teachers engaging in research providing relevance to the practices of the university laboratory school to the outside community. Consistent with Dewey's vision, laboratory schools in Finland utilize teacher-research as standard practice for teachers to participate in regularly. Moreover, preservice teachers develop a research study during their certification process to illustrate their understanding of the importance of research in the classroom (Henning, Petker, & Peterson, 2015). Barbour and Mc Bride (2017) advocate using a research consortium for lab schools of today to collaborate and enhance their research capability. Publishing research became eminently crucial to Dr. Dewey, however, few laboratory schoolteachers of today independently or collaboratively conduct research occurring within their classrooms.

Expanding the view of the teacher beyond the role of researcher, another administrator reported that finding the right teachers was critical to the success of laboratory schools today; not just because of the teaching, but also because of the added focus on teacher preparation that laboratory schools embrace as part of their mission. Finding individuals who are expert teachers, who recognize the value of and process for research and who can mentor and teach other adults is exceptionally challenging (Jozwiak & Vera, 2016).

Dewey also identified challenges associated with finding qualified teachers as do administrators today. However, the difference between the two eras depended on the mission of the laboratory school. Today, many laboratory schools, as identified in their mission statements, focused on teacher preparation (Jozwiak & Vera, 2016). To help ensure laboratory school teachers are experts and to meet state teacher licensing rules, the contemporary laboratory schools required teachers to hold at least a Bachelor's degree. Lead teachers at 30% of the contemporary laboratory schools held master's degrees. Dr. Dewey also preferred teachers with graduate degrees, but Dewey's focus emphasized teachers with a specialization rather than a general degree. Interestingly and in contrast to today, the teachers at the Dewey school often published and provided service in their area of teaching specialization.

Professional Development: External and Internal Opportunities

Each laboratory school involved their teachers in professional development. At The Dewey School, teachers developed and disseminated knowledge about pedagogy that employed the scientific method within their areas of expertise. This expertise resulted in professional development opportunities for the teachers at The Dewey School. Katherine Camp, an expert in science, and Althea Harmer, a specialist in textiles, design, and biology, instructed students in the summers at the Chautauqua Institute. Camp taught "Elementary Experimental Science" while Harmer wrote a lesson titled "Typical Industrial Material as Utilized in Elementary School Work" (Durst, 2010a, p. 69). Additionally, Camp and Harmer worked closely with biologists at the Woods Hole Marine Biological Laboratories during the summers to gain professional knowledge (Durst, 2010a).

Further, after teaching all day, teachers at The Dewey School visited Hull House, a settlement house for immigrants, and listened to speeches. Jane Addams, who established Hull House, believed, as did Dewey, in the importance of the pragmatic theory in education (Seigfried, 1999). Additionally, the Hull House had a Labor Museum that served to preserve and teach skills such as weaving, printing, and shaping iron to young immigrants by artisans from their native country (Hajo, 2018). Dewey's teachers worked to help open the museum, which illustrates the unique perspective of Dewey to expand the teachers' knowledge about issues of social justice involving immigrants. Dewey held additional unique views on the professional development of the teachers at his school.

Rather than focus on professional learning as a goal, Dewey believed "professional learning was a by-product" (Tanner, 1997, p. 102) of effective teaching. Each member of the school community: Parents, Students, Teachers, and Administrators, transformed into learners through the expertise of others as they interacted at school functions, Hull House events and in the neighborhood. Communities of Practice (Lave & Wenger, 1991) did not formally exist in this era; however, the concept of each person learning from each other permeated the school (Tanner, 1997).

Professional learning in contemporary laboratory schools emerged as a by-product because of the emphasis on teaching and mentoring pre-service teachers (Jozwiak & Vera, 2016). All of the contemporary university laboratory schools identified developing future teachers as a part of their mission statement. Pre-service teachers observe master teachers and practice the craft of teaching while attending college classes. The master teachers support the professional learning of pre-service teachers through daily interactions; however, this is not the only way contemporary laboratory schools provide professional education. Today's laboratory schools use professional development to form connections within the community.

The contemporary laboratory schools provide professional development to district teachers and early childhood professionals to connect the university to the broader education community, specifically focusing on the public schools (Jozwiak & Vera, 2016). This response of university laboratory schools to focus on connections to local districts may have occurred as a result of *A Nation at Risk Report* in 1983 (United States Department of Education, 1983). The message of this document elicited concerns about the quality of education and a subsequent disconnect between universities and public schools (Burton & Greher, 2007; Holmes Group, 1986; Jozwiak, 2010; Sirotnik & Goodlad, 1988). Some university laboratory schools formed professional development school partnerships to address the missing connection. Other contemporary laboratory schools, fifty percent, provided professional development in the form of workshops, training, and technical assistance for community education professionals not directly affiliated with the university.

Further, today, the professional development of laboratory school teachers included learning how to mentor and prepare pre-service teachers (Jozwiak & Vera, 2016). In a qualitative study including public school teachers, Head Start teachers, and University Laboratory School teachers, Jozwiak (2010), found that having pre-service teachers in their classroom prompted reflective thinking by the mentor teacher. For teachers in Dewey's laboratory school, engaging in the scientific process contributed to the content in their professional development.

Along with mentoring pre-service teachers, laboratory schools of today overwhelmingly served as internship sites for pre-service teachers and other professionals who would work with children and families (Jozwiak & Vera, 2016). Mentor teachers benefit from interns in other disciplines because the mentors reflect on the interconnectedness of education and music, psychology, or art. Although professional development in lab schools today contrasts starkly with what occurred in The Dewey School, both values improving the knowledge base of teachers.

Community Collaboration

Community collaboration at The Dewey School occurred in a variety of ways. One example of community collaboration happened with Jane Addams at the Hull House. Jane Addams worked closely with Dewey and embraced the culture and plight of immigrants living near Hull House, a topic often avoided by society in the 1890s. Teachers from The Dewey School attended lectures by Jane Addams, who spoke on democratic ideals, and the struggle immigrants faced to achieve those principles (Seigfried, 1999). As the teachers engaged in discussions and activities after the lectures, the teachers expanded their knowledge about democracy and when in the classroom, the teachers communicated and involved students in learning about the democratic process (Dewey, 1899; Dewey, 1938, Durst, 2010a).

Additionally, collaboration occurred with the families of the students attending the school. Dewey believed the home and school should seamlessly connect; thereby Dewey proposed a Parent Association to develop a relationship between the school and the home. Dewey discussed two primary rationales for establishing the association. First, families should understand the reasons why specific theories augment their child's and other children's education. Second, families should witness changes in the knowledge attained by their children from the research at the university lab school. According to Tanner, families developed an understanding of how theory and research transforms a child's thinking (1997).

In comparing The Dewey School to contemporary laboratory schools, family and community collaborations involved internal collaborations within the university, and external associations, outside the university. In collaborating with families, contemporary schools reflected intentional opportunities to interact with and form relationships with families. For example, creating a physical space for families to feel welcome in the school, field trips with families, or special events in the community where families gather together. These opportunities provided essential relationship-building support but did not necessarily target developing family's understanding of education and learning that was practiced in the Dewey School. Within the university community, laboratory schools that sustained themselves over time, established relationships with other disciplines at the university besides education and most often these affiliations involved research. For example, one laboratory school supported collaborative research between university faculty (e.g., engineering and nursing) and various industries. When laboratory schools served as sites for research that incorporated disciplines outside of education, the research highlighted the laboratory school in the city and created a space for cross-disciplinary discussions to occur on the university campus (Jozwiak & Vera, 2016).

External collaborations resulted in developing additional funding resources. One laboratory school cooperated with large corporations, which in turn brought monies to the laboratory school that funded small-scale projects such as playgrounds. (Jozwiak & Vera, 2016). Branscomb and McBride (2005) describe how developing a relationship with the external community expands research opportunities, funding sources, and the influence of the university laboratory school in the surrounding community. Barbour and McBride (2017) encouraged laboratory schools to partner with other university laboratory schools to further research capabilities, establish relevance to the community, and enhance sustainability.

Research

Dr. Dewey originally intended The Dewey School to be a laboratory for studying and disseminating research about applied psychology. Instead, the school contributed knowledge about the education of children through scientific pedagogic experiments (Tanner, 1997). The Dewey School teachers connected theory to practice while investigating their hypotheses in the classroom. Many of the changes occurring from the outcome of the experiments continue to affect practice today.

However, even though it appeared that The Dewey School succeeded, some researchers disagreed and believed few results occurred from the grand experiment. According to Knoll (2014), the unfortunate demise of the laboratory school under Dewey's philosophies "did not pass the test" (p. 44) as the time to see the fruition of his work ended early. Knoll described this demise as related to the lack of administrative skills of Dewey's

wife at The Dewey School. Durst's (2010a, 2010b) analysis of the teacher's documents provided an alternative view. Durst believed the experiment passed the test, and Durst attributed this gain to the teachers. In his analysis of texts, Durst (2010a) offers additional insight into the role of the teachers in reporting research.

> "Instead of passive recipients of the information who were judged on their ability to memorize and recite, students were active participants in learning experiences designed to engage them in problem-solving. Instead of compliant followers from the administration, teachers were content experts who created educational experiences that would carry students from their interest to mastery of content deemed essential. The transformation came about thru social engagement of teachers and students" (p.71).

Durst (2010a) determined that the teachers played a significant role in the research and forged the pedagogic discoveries at The Dewey School. As they worked side-by-side with Dewey, they examined instructional ideas and analyzed data. Mary Hill, a laboratory school teacher, wrote a manuscript, which focused on the continuity of content in her arithmetic lessons (Durst, 2010a). Many of the published articles of the teachers revealed their crucial role in research at The Dewey School. Another example included a Flax project completed by Althea Harmer called *Textile Work Connected with American Colonial History* (Harmer, 1904). In this project, the children created designs with flax while also learning how the colonies used flax to create thread and clothing (Durst, 2010a).

Consistent with Dewey's value of research in The Dewey School, all contemporary laboratory schools cited research as part of their mission (Jozwiak & Vera, 2016). However, laboratory schools differed on the depth of research carried out. One contemporary laboratory school dedicated a floor in their building, including areas for observation, database files, and a research administrator, while other laboratory schools permitted observations in the classroom. Contemporary laboratory schools developed procedures for approval of research using the Institutional Review Board (IRB) and held meetings to approve research. Jozwiak and Vera (2016) found 20% of today's laboratory schools reviewed research proposals. Schools varied in the percentage of research conducted with 30% having extensive research occurring. One contemporary laboratory school planned a separate research center with two-way windows and accessible data and for encouraging research at the laboratory school (Jozwiak & Vera, 2016).

Even though the infrastructure remained similar across The Dewey School and contemporary laboratory schools, the researchers in today's laboratory schools reflect a larger constituent group than at The Dewey School. Laboratory schools today comprise a broader team of researchers including undergraduates, graduates, laboratory teachers, and faculty. Laboratory schools today overwhelmingly (70%) provide opportunities for research for graduate students. Barbour and McBride (2017) confirmed the need for increased research capacity using a consortium of laboratory schools with a focus on Applied Developmental Science. University lab schools within a consortium expand research by including the possibility of a diverse demographic data set, integrated disciplines, and resulting in robust early childhood research. The laboratory school collaborative of Barbour and McBride (2017) resolves many of the struggles associated with developing vigorous research agendas advocated by Dewey.

The Dewey School incorporated teachers as researchers who published and discussed their research in public forums. Research in today's laboratory schools occurred across disciplines with interdisciplinary studies in nursing, physical education, exercise science, health and nutrition, psychology, business, and even engineering. Outside the university, research at the contemporary laboratory schools emerges from interests within nonprofits and large corporations. Additionally, laboratory schools of today did not collaborate with public school districts (Jozwiak & Vera, 2016).

Contrasting The Dewey School and Today's Laboratory Schools

The Dewey School and contemporary laboratory schools, although in different periods, displayed similar challenges. Developing a diverse school population continues to be a problem. Achieving more than one area of diversity remains a struggle because of the need to fund the laboratory school using tuition. Even though Dewey appeared unconcerned about reaching a diverse population, the school required tuition to remain solvent.

Additionally, management and the organizational structure of laboratory schools continued to be an issue. Administration in both periods required degreed personnel. However, today's laboratory schools involved fewer tenure-track faculty managing the program. The analysis revealed both times valued connection to the College of Education (COE) or Department of Philosophy for The Dewey School. One reason for this relationship could be the teacher education programs originating within the COE and community collaborations in contemporary laboratory schools, housed in the COE, involving pre-service teachers.

Even though pre-service teacher education lacked emphasis at The Dewey School, both Dewey and contemporary laboratory schools valued teachers with strong credentials. Most credentials today align with state guidelines, which often focus on a general focus for teaching elementary children. Dewey, on the other hand, believed his teachers required more specialist knowledge, such as biology, textiles, or woodworking. Both eras valued developing and disseminating research. However, few of the contemporary laboratory schools highlighted this attribute as occurring among their teachers. The professional development of teachers at The Dewey School also differed in focus with the Dewey believing professional development as a by-product of the teachers' instruction rather than enhancing teacher and pre-service teacher skills. Today, professional development involves the teachers mentoring, supporting and developing the skills of pre-service teachers during field experiences or internships.

In contrast to the variances in teaching and professional development between both eras of laboratory schools, the reasons behind community collaborations remained similar for each entity. Along with the significance of community collaboration to laboratory schools in both times, research occurred as a valued component. Dewey's primary researchers, in addition to himself, appeared to be the teachers at the school. Similarly, today, teacher research has been encouraged as a practice to develop the application of theory to practice. McBride et al. (2012) explained how faculty-led research teams involving laboratory schoolteachers and college students encapsulate the three-part mission of laboratory schools: Teaching, Service, and Research while meeting many challenges faced by university. However, few present laboratory schools focus on teachers implementing the research as The Dewey School emphasized (Jozwiak & Vera, 2017).

Correspondingly, funding and administration continued to be a challenge faced in both times. Both The Dewey School and the contemporary laboratory schools exhibited comparable problems in regard to sustainable finances. Dewey's school lacked backing from outside sources and subsequently relied on tuition. Today, many schools required tuition to support the budget, however some, with state-funding support, developed sliding scales for tuition. Utilizing tuition reduces the economic diversity of children attending the school; thus, research findings can be less representative of the community, thereby negatively affecting relevance of the research to the university and local community (Jozwiak & Vera, 2016).

Lessons Learned to Meet Challenges of Today's Laboratory Schools

Both Dr. Dewey's successes and failures teach contemporary laboratory schools aspects to avoid and features to emulate. According to Litvinov et al., (2018) ten challenges face today's public schools: School Funding, Child Safety, Child and Staff Stress, Appropriate Discipline, Prolonged Absences, Government Initiatives (Every Student Succeeds Act), Supporting Dreamers, Appropriate Technology Use, Vouchers and Public Education, and Elected Officials. Although public education today and in days of The Dewey School differ greatly, Dr. Dewey challenged many societal issues such as gender equity, immigration, family and school connection, compulsory attendance, and many other issues (Durst, 2010a).

The Dewey School valued teacher creativity, inquiry, and pedagogic decisions (Tanner, 1997; Durst, 2010a) yet struggled with administration and funding. Within the organizational structure of today's laboratory schools, the administration faces difficult funding dilemmas, which can result in employing regulatory policies, and structures that reduce teacher autonomy and affect curricular and educational decisions to save money. One laboratory school reported they became a charter school because the funding enabled them to continue operations and provided autonomy in curricular decisions. Few of the contemporary laboratory schools who sustained themselves over time included a local school district within their organizational structure because of the lack of autonomy and the increased bureaucracy of public education (Jozwiak & Vera, 2016). Given the increased emphasis on educational reforms during the last century up to current times (Iorio & Yeager, 2011), laboratory schools must critically and carefully discuss the mission of the laboratory school, deciding how to structure the classes to provide the atmosphere for educational innovations that challenge problems facing schools today. The organization of the school affects the handling of child safety, appropriate discipline, prolonged absences, supporting dreamers, and appropriate use of technology. Lab schools of today should ask themselves about the research they are conducting in relation to government initiatives. Are we critically analyzing how to meet or revise government initiatives for the success of all children, as Dr. Dewey addressed?

The organizational structure influences the financial structure. Contemporary laboratory schools varied in their economic composition with each school choosing their funding structure regarding the students served; families served, philanthropic support, location (state and city funding) and type of organizational structure (Charter School; Federal program). Another lesson learned from The Dewey School involves analyzing the populations served, recognizing the interactions of how one decision (e.g., enrollment) affects other decisions (e.g., relevance to the university and community). Further, although The Dewey School did not have access to funding from the government, government educational

funding can provide additional monies to serve diverse students. Contemporary schools should reflect on their mission, such that financing does not affect the pedagogic autonomy of the school. How can the university laboratory school remain sustainable and provide opportunities for diverse students? Few schools from the laboratory schools surveyed (Jozwiak & Vera, 2016) connected directly with public schools. How are laboratory schools of today collaborating with public/private schools to solve the challenges both experience? According to Quartz et. al. (2017), Research Practice Partnerships (RPP) in four institutions join with urban school districts to work collaboratively to solve district problems.

Another lesson from The Dewey School, which also connects to the organizational and financial structure of the Laboratory School, involves the influence on the local community and broader society. Dewey identified teachers who were interested in social issues and transforming society through his laboratory school. Dewey and his staff often met at Jane Addams Hull House to discuss and broaden their understanding of the history, culture, and laws related to immigrants. The ultimate goal of these discussions is for teachers to expand their knowledge beyond the classroom in hopes of developing active citizens in a democratic society. The school became more than "just a place in which to learn and acquire certain forms of skills but a place for problem-solving in a democratic society" (Camp-Mayhew et al., 1936, p. 466). Laboratory Schools of today can learn from The Dewey School the value of emphasizing social justice issues with children and families to affect change locally and globally.

For example, when laboratory schools of today include a more diverse population, research addresses issues of safety and appropriate discipline. Litvinov et al (2018) identified how restorative discipline addresses the school-to-prison-pipeline through practices that understand the broader scope of behavior problems. Whether a laboratory school includes and supports dreamers or encourages families and children to advocate and even defend dreamers, these practices develop an understanding of social equity and justice. Teachers who teach, model, and implement projects related to social justice issues encourage children and families to consider how their daily decisions influence society, just as The Dewey School did through the work at the Hull House.

Contemporary laboratory schools could learn from The Dewey School about carefully selecting the teachers. Dr. Dewey hand-selected each teacher, identifying specific knowledge and academic passions. Rather than employing teachers with general knowledge, Dewey chose specialists trained at the top institutions and who had interests in social issues of the day. Dewey hired qualified, dedicated teachers who believed in his philosophy, worked courageously amid negative attitudes toward progressivism, and communicated their classroom innovations through scholarly activity (Durst, 2010a).

Many of the contemporary laboratory schools identified hiring master teachers. However, they should give attention to the additional credentials, outside interests, and even research abilities of the teachers employed. Laboratory schools of today should research what are the best teacher qualifications. Would hiring teachers with a more specific academic focus enhance the learning of their students? Research, such as this suggestion, might oppose state agency certifications, but this should be the focus of a university laboratory school, to challenge the status quo.

Dewey believed in teachers researching pedagogic practices, and according to Henning et al., (2015) and File (2012), both teachers and pre-service teachers should be investigating their teaching practices. University laboratory schools hold the unique situation of being able to develop research practices in pre-service teachers, such that research in the PK-12 classrooms occurs on a regular basis. Although few laboratory schools today include this preparation, if research evolves into a common practice in laboratory schools, teachers will propose, test and provide evidence to assist in transforming practices.

Interestingly, both Dewey and the lessons proposed in this article involved the significance of research for a laboratory school. Teacher-led research in Dewey's era contributed to the understanding families had about how children learn, which was starkly different from school in the 1880s. Additionally, teachers discussed social issues with children and families, providing new perspectives for families to consider (De Pencier, 1967). Using their researched pedagogy and emphasis on social justice issues, teachers at the Dewey School published articles, but teachers outside the Dewey School rarely participated in scholarly writing. (Durst, 2010a, Harmer, 1904). Barbour and McBride (2017) proposed lab schools form a consortium to enhance the quality of their research. As lab schools develop research agendas, and assure the research remains relevant to the community, their reputation and subsequent funding are affected positively (Jozwiak, & Vera, 2016).

In addition to the significance of research to be included within the structure of a laboratory school, diversity, something The Dewey School lacked, holds an essential lesson for laboratory schools of today. The Dewey School lacked economic diversity, a particular trait most laboratory schools today realize but struggle to implement. The problem remains related to the financial structure of the laboratory school but affects the research, thus influencing the relevance of the school to the community. For laboratory schools to remain relevant to the city, the institution should aim to be inclusive of diverse families. The consortium suggested by Barbour and McBride (2017) developed a broad database across laboratory schools to encourage robust results.

The last lesson from Dewey's school involves his emphasis on the children and their families. Dewey understood the value of the family and the home since historically, many believe, this is where education originates (Wortham, 2002). The Dewey School engaged families through parent meetings that explained learning theories and discussed research with the families (Tanner, 1997), which contrasts with laboratory schools of today. Once again, research emerges as the significant difference between the two eras. When contemporary laboratory schools share research that investigates challenges experienced in the community, state and nation, laboratory schools initiate a change in mindset within the community.

Both the Dewey School and contemporary laboratory schools of today differ. However, educational trends affected both eras. The Dewey school combated rote learning, problems with attendance, limited knowledge about pedagogy, and little family involvement. Today, laboratory schools battle the results of standardization of the curriculum, mandates from government reforms, meeting the needs of diverse students and the pressures of funding. Dewey encountered similar trends, and he refuted each challenge through intentional research of educational practices and providing evidence to motivate change in education. The question remains, how will university laboratory schools of today utilize research to question the obstacles facing schools of today?

Educational changes continually occur with the possibility to affect a university laboratory school's autonomy, pedagogy, funding, and many other areas. University laboratory schools of today have choices to make and the option to change the future. Therefore, the university laboratory school of today must be attentive to these trends and chart their future.

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Collaboration, Reflection, and Dialogue: How a Group of Laboratory Schools are Creating a Community of Practice

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The Laboratory School

Laboratory schools have been around for more than a hundred years. They evolved from their traditional role of preparing future teachers to many other functions. The concept of an ideal lab school has been reshaped even when teacher preparation is still a primary and fundamental characteristic. These devoted centers for learning are characterized by an enhanced level of freedom in developing their curriculum, materials, or teaching practices. More than fostering in-depth clinical teaching experiences for many future professionals, laboratory schools never stop to further the training of practicing teachers and staff beyond their schoolhouse gates. Research is also another area of development in the twenty-first century laboratory school. Teacher training, clinical observations, innovation, curricular development, professional advancement, and research are taking place parallel to teaching and learning. To juggle all these may seem like an insurmountable task, but laboratory schools differ, and some take on particular roles leaving other tenets in the shadows. This is not something negative in itself. It just speaks of a diverse set of learning centers that may freely choose their own paths. Some may concentrate on teacher training while others focus on research, curriculum, or innovative teaching practices. Regardless of its area of practice, each laboratory school is surely striving to adequately respond to the constant changes in the field of education while reforming the art of teaching. This is no easy task (Buck et al., 1991; Matthews, 2020).

Community of Practice

The concept of communities of practice has been emerging, yet it is not new. A community of practice substitutes an individualistic approach to solving a problem with a collective attempt. This system illustrates what happens when human beings work together while helping each other learn. The individual becomes secondary as the collective effort takes center. Teachers, for example, consistently meet to help each other solve a common problem or to deal more effectively with tasks that are inherent to their profession. Communities of practice are not just people working together. They must be composed of enthusiastic participants, inquisitive scholars, who share a mutual concern, and are there willingly and purposely. Teamwork and interaction are key bases for success within a community of practice. So, professionals of any discipline would benefit by building the expertise and competences necessary to address a particular challenge in their commonplace scenarios. Teachers can benefit greatly by being part of communities of practice. (Močinić & Tatković, 2021; Bergan et al., 2021).

Laboratory Schools as Communities of Practice

I argue that developing a culture of collaboration among laboratory schools will empower all regardless of their areas of expertise. Each school has chosen a path and should follow it, but they do not have to go through it alone. Collaborative inquiry, for example, is one way schools can establish conversations that sustain each other through a supportive relationship. They help and encourage each other to attain different and particular goals (Emihovich & Battaglia, 2000). The concept of collaborative inquiry is not new. It happens when a student-teacher and the teacher in charge of the class meet regularly to speak and reflect on their practices together, or when a group of teachers meets to study together and engage in strong relationships of guidance and support (Cutler et al., 2012). Some of the characteristics of a culture of collaboration include meeting in a group, questioning and studying a topic, and then reacting as a result (Reason, 1999).

The International Association of Laboratory Schools (IALS) has been sponsoring and supporting hundreds of laboratory and university affiliated schools since its creation in 1958. Every school year has brought its challenges since then, but a new level of hurdles surfaced with the COVID-19 pandemic. During March of 2020, laboratory schools began to find new

ways of educating as in-person teaching was replaced with online classes (Justis et al., 2020). Collaborators from the board of directors and member schools met to find new ways to continue assisting laboratory schools during this very difficult time. Ideas were developed around the concept of collaborative inquiry and research. Schools needed to find new ways to continue providing each other supportive dialogue in a world that shut the most common and effective communication systems that schools had spent years developing and perfecting. This meant that the annual face-to-face conference had to evolve into a virtual oblivion as the globe closed all opportunities for physical encounters. How do we continue to engage, participate, and carry on with our rituals and practices as an international organization? First, we decided to remain committed to each other by creating online spaces just to listen. From that initiative, we went on to reflect and identify ways to help each other. One world and one pandemic, but a plethora of settings according to each individual school. One reason for the projected success of this story is that individuals met, listened, and respectfully acknowledged everyone's reality. This is what inspired and fueled the collaborative project.

Chriss Bogert, Vice Principal for the Jackman Institute of Child Study at the University of Toronto in Canada, defined the collaborative project among several laboratory schools members of IALS as an effort to:

> Collectively explore Laboratory School's experiences during the Covid-19 pandemic, what we have learned, and how we will support the needs of our students, parents, and teachers in its aftermath. We each have stories to tell about how we as Laboratory Schools rose to the challenges presented by the pandemic without sacrificing what we know about childrens' needs and how they learn best. Together, we have an opportunity to speak in a collective voice through the IALS research collaboration (C. Bogert, personal communication, July 26, 2021).

This collaborative research project will not only shed light into a new reality lived by all, but also set the stage for professional progress and advancement as participating schools pay close attention to those taking part in the collective dialogue (Niez et al., 2011). Schools must evolve to be able to meet the needs of a changing world. Learning, listening, and supporting each other is a powerful tool for change (Cutlet et al, 2012). Each participating school will conduct its own research as they meet with the group once a month to hold dialogues about the particulars of conducting research in a laboratory school, designing effective surveys, focus groups, publishing open ended questions, working with narrative data, writing abstracts, and more. Each encounter is structured into three parts to facilitate the collaborative dialogue. First, a member school or an invited guest shares a snapshot of research in lab schools. This provides an opportunity to listen and understand research according to the realities and needs of every school. Then, the group focuses on the exploration of a topic related to the research process. Discussion of research methodology, tools, data collection and analysis, and publication are the center of this part of the meeting. This second part of the meeting provides a guideline for the development of each individual research idea. It also serves as support and motivation to face all areas, known and unknown, of the research process. Being equipped and focused are major generators of essential momentum. Keep in mind that research is an additional responsibility to teaching, so keeping teachers energized is one of the goals of collaborative initiatives.

Finally, time is dedicated to supportive collaborations when group members react and share ways in which they can help and learn from each other. How is my experience different from yours? What are your struggles? How can we, leading different research ideas, overcome similar obstacles to further individual abilities and imagination? Can I be a teacher and a researcher simultaneously? Supportive answers to these questions will build relationships making individual research goals viable. Isolation, on the other hand, could mean insecurity leading to inaction feeding the status quo. This is a dangerous enemy to the already struggling laboratory school. During this part of the meeting, participants develop a powerful language that is able to overcome all consuetudinary forces aimed at the twenty-first century lab school (Schwartz & Gerlach, 2011). Speaking and working as a group ensures each school's presence and viability through time.

At the time this text is being published, the final result of the collaborative research project is not ready. Yet, it is evident that the energy generated from the constant group meetings is what has kept this group together in times of common struggle and will keep them that way until the final publication or very end of this project. As an international organization of laboratory schools, we know that this project will lead to other collaborative ideas as each effort is transformed to keep every school afloat and ready to face future challenges. The message we want to communicate is that teachers do not have to work alone. Children and young adults are at the core of what we do, so in times of difficulty it is fundamental to replicate the close relationship we have with them. Learning from each other is the basis for this collaborative idea. We know that this cycle will strengthen each laboratory school and at the same time strengthen the international group of schools as well. This is true not only of research practices, but also of innovation, professional growth, curricular development, and every tool and opportunity present in all laboratory schools.

Working "alone is far more difficult than when laboratory schools join to pursue common goals. The essential ingredient in the success of such collaborative projects is good leaders, people with passion for the value of dialogue, discussion, and inquiry embedded within practice" (Cutler et al, 2012, p. 256). IALS is filled with passionate people who are learning to value dialogue in the name of teaching, learning, and above all, in the name of children from all parts of the world.

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Author Biography

Nicolás Ramos is Assistant Professor at the University of Puerto Rico Secondary School. He has worked at the lab schools since the fall of 2002. In 2007 he was appointed Director and held that position until August 2014. Since then, he has been teaching English at the Secondary School. He has worked with student-teachers for over 15 years and currently teaches a seminar on Legal Aspects of Education at the College of Education. Nicolás has served on the IALS Board of Directors since 2008.

An Interview with John Goodlad on the Role of Laboratory Schools and the State of American Education

RESUBMITTED BY THE 1992 IALS BOARD OF DIRECTORS

Editors: We appreciate the fact that you took time from a busy schedule to allow us to ask you a few questions for the National Association of Laboratory Schools Journal. We would like to know your thoughts on the years when you worked with laboratory schools. Since you served for a time as a laboratory school director and you've walked in our shoes, so to speak, could you comment on your experiences?

Goodlad: I think that I was lucky in that I came in as the director of the UCLA Laboratory School with an asset that it had not had before. That is, as a result of a study done by some people inside the university, comprehensive recommendations affirming the view of the laboratory school had been developed. It was the same old situation where every now and again the question is raised, what is this place supposed to be doing, what is it for? They had done a comprehensive study in which they had, to quite a considerable degree, defined what a laboratory school ought to do and what it ought to be about at this kind of institution.

I think it was the best report on laboratory schools that I had read up to that time. The recommendation that was significant pointed out that in order for the laboratory school to fulfill the functions they defined for it, it needed more than a principal to run the school with the children and work with the teachers. It also needed a director to link the school to the rest of the university and help it to perform its functions. So, I was the first director of that school.

The school's founding principal, Corinne Seeds, a great woman who had studied with William Heard Kilpatrick in progressive education, had run the school as a school for children. *As* the university became more research oriented, the question raised pertained to the role of the laboratory school in this kind of university.

The job was just too much for a principal to be able to take care of children and parents and meet the needs of the university, too. So, l came in as director with the opportunity to choose a principal to operate the school on a daily basis. That was a unique kind of beginning.

Editors: What do you believe should be the mission of laboratory schools today?

Goodlad: I think the laboratory school mission needs to be tied to the mission of the particular kind of institutional setting of which it is a part. I don't think that a laboratory school in a heavily research oriented university and a laboratory school in a heavily teacher preparing university should necessarily perform the same function. It *is* a little ridiculous to think that, in a teacher preparing instruction not heavily oriented to research, the laboratory school ought to serve the research interests of the faculty. Whereas, at a place like UCLA, the faculty always maintained, regardless of any reports that had been written, that the main purpose of the school was to serve the research interests of the faculty.

My own view of the laboratory school is that whatever other functions they perform, all laboratory schools should be places that do things often only talked about in the public sector. Special innovative things can be done in a laboratory school where there is control over admissions. If parents don't want these things, there are other schools they can go to.

The one thing that should be common to all laboratory schools is that they should be experimenting, trying other ways of doing things, showing how things might be done differently, opening up periodically to let people see what they have done. Take cooperative learning, for instance. Cooperative learning has been around in the literature for about twenty years. What does this look like when you develop it? Or what does it look like to use a multiplicity of pedagogical approaches to get all of the children learning?

The laboratory school can be a creator and demonstrator of alternative ways of providing educational delivery systems. But, whether after that they are primarily involved in teacher training or primarily involved in research *is* going to be determined by the context of which they are a part.

Editors: What do you feel is the role of the laboratory school in the current restructuring efforts that are going on nationwide? How can the laboratory school be a beacon for change, so to speak?

Goodlad: Well, I think that is what is happening in regard to renewing both school and teacher education in our work. Once we begin to say that teacher education programs ought to be conducted in professional development or partner schools, in large part, those partner schools in turn ought to be excellent renewing schools. It shifts the responsibility for teacher education in a laboratory school. That is, no longer does the laboratory school become the prime setting for student teaching. It becomes a place for future teachers to get opportunities to view new things going on.

I think this movement reduces the student teaching roles of laboratory schools enormously. Many school districts do not think that laboratory schools prepare teachers for them. If the laboratory school at UCLA had been the only place available for student teaching, students would have endangered their job prospects in other schools in the area. You had to do student teaching in a public school district and get a good grade from the cooperating teacher from that school district.

No longer does a laboratory school have to be the slave, if you will, of a teacher education program. It can be a place announcing, "We're going to do interesting, different things so that students can get a glimpse of alternative ways to deliver education." The laboratory school can play a role in demonstrating alternative ways to conduct schooling so that renewing schools can better see those alternatives which are available to them.

Editors: What can the National Association of Laboratory Schools do to help perpetuate laboratory schools and help the laboratory school movement go forward in today's society? With more and more teachers being prepared by universities, obviously laboratory schools cannot handle so huge a load. So, what can NALS do to help perpetuate the laboratory schools which we believe in very deeply and feel serve a very important purpose?

Goodlad: Well, it's a given that an organization is going to try to preserve itself. This is always dangerous because organizations that try to preserve themselves for their own ends in the field of education tend not to survive.

We have quite a history to show that when a laboratory school that had few friends in a given university got into trouble, the only support it had was from the people who taught there and the parents who sent their children there. It was not at all uncommon for some of the strongest criticisms and strongest moves to eliminate the school to come from inside the university itself.

It would seem to me that what the laboratory school movement needs at the present time, and the present time is critical, is a very careful introspective and, if you will, extraspective, look at how the lab schools can answer the questions that you just raised of *me* before.

It would seem to me that if NALS could secure a grant in order to get an independent inquiry into the role of the laboratory school at this juncture in our history, that would provide a useful service, as well as rich material for your journal, rich material for your conferences, and from such a report could evolve many kinds of activities.

I have not been involved with NALS for quite a few years. I addressed it on at least two occasions in the past when I was still director at UCLA. The last time I remember being associated with NALS I was brought into answer the question, "What can we do to save ourselves?" That was a pretty depressing meeting, and I wasn't very encouraging. I said I didn't think that the laboratory schools had vigorously enough convinced people that they had a role to play.

Now, NALS should do a study of the lab school movement, the current laboratory school situation, the prospects for the future and what the future direction should be. The study group might include two or three people from laboratory schools. But I think it ought to be, in many ways, an independent review because any effort that is designed to tell the world what laboratory schools ought to do that comes from the laboratory schools' group itself would be regarded as self-serving.

Editors: Over the last ten or fifteen years we have gone through a series of educational reforms. As future educators and historians look back over what's happened in education in the 1980s and 1990s, what do you think is going to stand out as the legacy of this period?

Goodlad: I think that if a historical perspective were employed, it would inevitably conclude that educational reform has failed. Schools haven't failed, but educational reform has failed.

The indigenous educational community doesn't talk about reforming itself. It is outsiders who talk about reforming the schools-politicians, businesspeople, and so on. And, they have endeavored in several eras, including the mid-l 960s and the mid-1980s, to press for school reform.

One would have to conclude that school reform which has been politically driven, and we need to make that distinction, has failed. It has failed primarily for two reasons. First, it has asked the schools to do what the schools cannot do. That is, it has asked the schools to be directly involved in improving the economy of the nation in the global market and putting better jobs on the table for workers. Schools can't do that.

The level of an educational system makes a difference in the economy of a country, but once your educational system is mature, as it is in the United States, that difference is very modest. An educational system can only be geared to stimulating the economy of the nation when the nation has an immature school system.

We know that when you get fifteen percent of your population with a high school education for the first time, the economy takes off. When you raise it to thirty percent, it usually continues to do well. But, once you get a mature educational system, the relationship between the performance of that system and the economy is *very* modest. And most economists know that.

If you take a look at some of the criticisms over the last few years and if you look at the writing of economists, they have

even used the word "silly" in regard to saying the school is going to make us economically competitive with Japan. The illustration I love to use is that, six or seven years ago, there was a Gallup Poll or Harris Poll that asked a sample of the American people to rank a number of major economic powers in the world. The second question was, "Do you think the country you picked will continue to *be* an economic power into the indefinite future?"

The country most people picked to be the major economic power was Japan. The answer to the second question was, "Yes, it will continue." The schools were condemned in the media over the situation.

Five years or so later, the same poll was taken and this time the United States not only came out on top, but the dominant response was that the situation would continue. There wasn't a single word in the press to say, "Look at the wonderful job our schools have done."

We ask the schools to do what they can't do and when the schools don't do what they can't do we blame them for not doing what they can't do. The result is that it takes our attention away from what the schools can do and results in very little support for what the school can do. That's the first problem. The second problem is that the model of educational reform is faulty. It's a linear model, an input-output model. You put this in here and something will come out there as though somehow or other you had a static relationship between a teacher and a child.

Here's your school. It's a box. Put things perceived to be good into it and good things will come out the other end. However, inputs cost money.

So, the next move was, don't worry about putting in, just worry about what comes out. Outcomes. Don't put anything in but you'll get outcomes. That model doesn't fit any school I know. A school is not a linear, predictable thing. It is a culture unto itself. It's a unique culture of movement, interactions, unpredictability, and so on.

When a teacher comes into a school each day, the last thing on his/her mind is whether or not what I do today will improve the nation's economy. What's on that teacher's mind is how do I get this kid excited about learning. Or, how do I get the message home about this youngster getting some sleep. Those are the things on the minds of teachers. If you want to improve schools, those are things in schools you have to deal with. Reform movements ignore them.

What has happened, to get back to your historical question, is that under the umbrella of a politically driven reform movement, with money made available from private and government sources, a lot of schools have made some significant progress. We have some very good schools around the country. They are very satisfying places for anyone who would want to send a child there. The trouble is, in making a school a great place for children, a great place for teachers, a place that parents like, we do not necessarily increase achievement test scores very much.

What I would hope that an insightful historian would say is that school reform as conducted during the concluding half century in the United States, politically driven school reform, has failed. However, many schools managed to sustain themselves under increasingly difficult circumstances.

The loss of social capital in communities and families and the rise of the value of financial capital to replace social capital meant less attention was given to the infrastructure, including schools. During this period of time, parents became a minority group.

There are fewer parents today with children in schools than there are people who don't have children in school. As a result, fewer and fewer people want to support schools because they don't use them, and they don't understand the public purposes of schooling. The major challenge before us today is to restore the idea that schools have a public purpose, and they are not just private places for the benefit of individuals.

I think that the most precarious situation that we are in right now is trying to have people understand char just as we must support parks, roads, and the infrastructure, part of that infrastructure is the schools. And, when we pay taxes for schools, we don't own them as private possessions.

Editors: If you could snap your fingers and make any ·one change in the way teachers are trained or in the current practices of training teachers, what would it be?

Goodlad· As someone who works systemically and thinks of institutions as ecosystems, that is very difficult. I would say the one change I would make is to try to bring together around a common mission all of the people who prepare teachers. This would include those who, often unwittingly, are preparing teachers in their disciplines, people who are regarded as teacher educators because they deal with the theory and practice of teaching, and the people who are practitioners in the schools.

I would like to see these groups working as an integrated coherent faculty addressing the mission of teacher education together. I think that would then give us a chance of having a teacher education program that has all of the parts fitting together rather than them being scattered the way they are today.

Editors: How would you view the current status of teacher education in the United States? What do you see as the positives and what are the negatives from the point of view of public perception?

Goodlad: I think that the greatest negative is an old one and it is our casual, neglectful attitude and actions toward supporting teacher education as professional preparation. When you couple that with this notion that we are all entitled to reach, the result is that you get the very complex, complicated process of cultivating learning in children being managed and directed by a reaching force of rather meager preparation. And, even the meager preparation is always being threatened by shortcut routes to do it more cheaply and unprofessionally.

Put bluntly, the biggest negative is that the gates for admission and preparation for teaching are always loosely latched, and that the lowest common denominator with respect to teacher education and preparing teachers tends to win in the long run. The high-level long-term preparation program of cohort groups of students under a mentoring faculty is very difficult to defend financially in our society. That's the big downside.

I think the upside is an old one, too. So many people at work on the street and on the farm can name teachers who did incredible things in their lives. And so, we have this idealistic conception of the teacher, coupled with casual, almost contemptuous, treatment of the circumstances that would produce the good teachers that we get virtually by accident.

I think of the conflict that is going on right now over whether or not within a relatively short period of time we can establish the idea that teachers must indeed be prepared with the same care and depth as other professionals or whether teaching is to be a part-time, short-term occupation that people will move through. We make it very expensive by training teachers the cheap way.

It is now known that it takes, on the average, five teachers to make one career. That is not true with lawyers, that is not true with doctors, and not true with engineers. It takes five teachers to make one career. That is the expensive result when you prepare teachers "on the cheap."

Editors: You spoke recently about the role of clinical experiences in the teacher education program. How important are clinical experiences in training teachers?

Goodlad: I wish we could get another word for "clinical" experiences. My colleagues and I get criticized because we use medical analogies and metaphors. I wish that we had better ones, but we haven't created them. I wish we had something else other than "clinical" because that has a medical connotation to it. The master teacher comes closer to what I am thinking about.

Returning to the role of the laboratory school, it seems to me that there is a challenge to the laboratory school. It ought to be a place where even with relatively short experiences, the future teacher is able to see hands-on teaching at its best. I think the problem with teacher education is that it does not provide a sufficient model or a sufficient frequency of a variety of models.

It is interesting to note from our research that if you ask students at the junior/senior high school level what subjects are of most interest to them and which they like most, consistently they put three subjects first that are not required for college admission and are not regarded as being highly academic-the arts, physical education, and vocational education. Those three consistently rank above all other subjects in interest and popularity on the part of students.

If you analyze those three subjects, they are the three that most frequently demonstrate the behavior desired. The coach in. physical education shows that this is the way you do it. The art teacher, if she is a real art teacher, comes by and says let me suggest this to you, let me show you this. She models. Hardly anywhere else is that true.

To be able in the laboratory school to show, for the neophyte to be immediately able to see the translation or the concept or principle into clinical practice, is essential. Maybe we would be better off just calling it "practice."

The reason I have been using the archaic word "pedagogy" so much is its definition: the art and science of teaching. We are really talking about the art of teaching. The pedagogical art of teaching is what future teachers don't get enough of. If there ever was an area that says, "do as I say, don't do as I do," it is teacher preparation.

You can go into class after class and see teachers in teacher education demonstrating what that teacher would not want their own students to do, like lecturing eighty-eight percent of the time. It is amazing. Don't do as I do, do as I tell you.

Editors: What is on the horizon for John Goodlad? What do you see yourself doing next? Where does your interest lie?

Goodlad: My options are now limited. I am hardly a kid. My administrative assistant, Paula and I chuckle from time to time because of letters asking me to make suggestions for distinguished professorships and deanships around the country. Do you have somebody to name? The bottom line is the query: Would you by any chance be interested. We chuckle because I have retired a couple times already.

There are only two things that I find are good about advancing age and I am doing both of them. I am living where I want, and I am doing what I want. When you ask about what is in the future, the answer is continuing living where I am and doing what I am doing.

My life all along has been heavily involved in organizational and administrative work. There has hardly been a time in my life when I haven't been administering something. I am now at the point where I have stopped doing many of the things I have done in the past. This is very painful because education has always been so satisfying to me. When I cut out something I do it as though I were cutting out an organ.

For example, I love to teach, and l was teaching the moral dimensions of leadership component of the Danforth program at the University of Washington. That runs through the entire year. It wasn't very time demanding and it was wonderfully satisfying, but every time I wanted to plan something, there it was on my schedule. I finally said that I do not want that on my schedule anymore, as much as I love it. I enjoy administration, especially its creative parts, but I have to give it up. I am not leaving what I am doing. I am simply recognizing that I am surrounded by some very capable people. They are all younger than I am. I have a committee at work now working on restructuring things in part to let me do more of what I want to do.

There was a wonderful story in the Sunday paper in Seattle recently about a very creative investment entrepreneur who lives in the Tacoma area. He advises companies that advise people on investing. He is advising the advisors. He has had a very successful business, but his years are moving on. He has had a kind of a family business with socials, picnics, and excellent benefit programs. Everyone loves to work for this corporation. One day he said to himself, I wonder what would happen if I dropped dead tomorrow. So, he sent a memo to his key management people to the effect that he had dropped dead. Now, what are you going to do with the company? His key managers then got together over the weekend and restructured the business. He is still very active in the company, but he is doing more of what he wants to do. That is what we are in the process of doing with our initiatives.

I have some more things that I want to say in writing. I have to get rid of business travel. I have to get rid of management in order to have sustained time for some of the writing that I want to do. On the other side, I happen to be a lover of boats, particularly wooden boats. I had a period of about fifteen months which were both frustrating and satisfying when I had a wooden boat built for me. It sits idle too much of the time. I plan to do more writing, boating, and fishing and some of what I have been doing in our National Network for Educational Renewal while letting other people take over most of the administrative side. I'm not sure that my wife, Lynn, fully believes me.

Reflections on Sewing in the Classroom

Kevin Goodwin
FALK LABORATORY SCHOOL, UNIVERSITY OF PITTSBURGH

Why do we teach kids how to sew? There are a lot of reasons for this. We spend a lot of time teaching about reading and math because those things are important aspects in life. We are surrounded by written words and math is used in so many facets of our days. We also are physically surrounded by things that are sewn. From the clothes on our backs to the shoes on our feet, we are in contact with sewn objects. And just like with math and reading there is a sense of freedom and agency connected with the ability to sew. If a button falls off your shirt you can either buy a new shirt or sew the button back on. I would much rather be capable of fixing my problem instead of having to purchase something new.

Getting Started

My story of sewing started when I was about 9 years old. My Mom tried teaching me how to cross stitch but I never really got into it. As teachers we hear from parents about their attempts to teach something at home only to have their child not want to engage. Whereas in the classroom surrounded by peers and with another person as a teacher there can be more of a willingness to try something out. I am sure that the gender bias for sewing (sewing is for girls) kept me from truly wanting to try it out too. Jump ahead 20 years and I am now at the Children's Museum of Pittsburgh. The "maker movement" is in full swing and the MAKESHOP exhibit is in its infancy. One of the activities that will be offered to visitors is sewing (both hand sewing and machine sewing) and I am told by our Director that I will not only need to learn how to sew but I will also need to figure out how to teach other people to sew. I had some really good colleagues who showed me some tips and tricks. It took a willingness to try things out and practice with hand sewing and machine sewing. I fondly remember getting a lot of sewing machine practice making aprons before the exhibit officially opened. Once I was in the thick of it, making pillows and pockets with ages ranging from toddler to senior, I started to realize that sewing was an ever evolving process. I was always learning new techniques (from colleagues and visitors) and making new projects (full-sized Jedi Knight robes) and constantly helping people tie knots, thread needles, fix tangles; along with all the organization and clean up that comes with the activity of sewing. Teaching sewing isn't easy, but it can be so rewarding. Hearing a 4 year old exclaim that they, "sewed for the first time!", was always an absolute joy.

I teach 1st and 2nd grade at the Falk Laboratory School at the University of Pittsburgh. Being at a laboratory school provides time and space to teach hands-on lessons. Our school puts a lot of emphasis on teaching kids using real materials and tools. These projects work in conjunction with our other academic lessons as well. We strive to create academic experiences that mix together multiple subjects at once. My class size is about 24 kids. The amount of time I would spend on a sewing lesson would be around 45 minutes to an hour.

The Sewing Process

Where do you start? I start by making a Halloween costume for my son with the class (this activity has been happening for the past several years; we have transformed my son, Oliver, into a bat, a dinosaur, a Pokemon and even a skunk). You might not have my exact circumstances but this idea can be translated into something that suits your space and time and students in your classroom. This type of project is a pre-assessment for sewing. In making this costume I am able to gauge the capabilities, the vocabulary, the questions, the apprehensions, the excitement, the ideas and so much more. I

could easily give the kids a worksheet to fill out with questions like, "have you threaded a needle?" or "what are your skills with tying knots?" But sewing seems to be something that needs to happen for kids to show you what they really know. We start the costume as a whole group but then it becomes a free-choice activity and in doing this you start to see who is interested in sewing or who is comfortable with the tools and materials and who is not.

There is always at least one student who will say, "I can sew." And your follow up question should always be "can you thread a needle?" and they might respond with, "yes". Then ask, "can you tie a knot on your own?" Chances are that they will say that someone else did that for them. So when they say they can "sew" it usually means they can "stitch." Someone has set them up with a project and done most of the hard work for them and they did the assembly through stitching (this goes for adults the same as it does for kids. I have had many adults tell me they know how to use a sewing machine only to watch them not put the presser foot down before starting to stitch). And when a student tells you that they actually do not know how to thread a needle or tie a knot then you can tell them that you will teach them how to do those things. Then they will be able to say that they can truly sew. They will be given the skills to do something on their own. Provide them with the space to express their intentions for wanting agency and then provide a pathway to be able to be independent. Freedom takes practice; so does sewing.

Magnetic storage for needles

What comes next in this sewing classroom is a deep dive into the basics of sewing. Again, creating something, like a costume for someone else, sets up an expectation that the things we make might not always belong to us. And this mentality is very important when it comes to teaching the basics of sewing. The process of sewing can be much more important than the product, especially when working with kids. Try to not focus on the product; this builds an environment that is prepared to explore and learn instead of worrying about what comes at the end. Sewing is about all the steps from the first cut to the last knot.

I typically take an entire week of classes (usually around 40 minutes long) to teach these introductory lessons. The progression of this week can change but there are a few things you really want to demonstrate and there are things the kids should practice more than once. There will be a lot of repetition but with practice comes more autonomy from the group. This autonomy will help with sewing projects that you plan to work on after this introductory set of lessons. We start with the question, "what is sewing?" and then you simply listen to what the kids have to say. You might hear things like: you use needles, you use thread, you use string, you can make things, stitches are when doctors sew your skin, sewing makes your hands stronger, a long time ago people had to sew their clothes...the moment the idea of clothes is brought up you pause and ask the kids to take a look at their clothes and shoes. Can they find examples of sewing and stitching on their clothes? And you would be amazed at the conversations that occur once kids start to realize how their clothes are put together. Once you notice these little stitches holding together something that you put on each and every day you start to appreciate them more and more. Each stitch is important. Each step in the process is important. And in teaching kids the process of sewing you are able to get them to appreciate every single step it takes to accomplish something larger. Every product requires a process. Whether that's sewing, addition, reading, handwriting or kicking a soccer ball.

Stuffed animal made by a student at home after learning about sewing in class

The rest of the week is spent practicing the process of threading a needle and making a straight stitch. Again, if kids can master these things and understand the process fully then they can move onto bigger projects. But, honestly, knowing how to thread a needle and make a stitch is extremely important. Again, these basics are not basic; instead, they are fundamental aspects of human society. They are stepping stones to a bigger world but at the same time they are the most important steps you need to take. Take your time teaching the kids how to cut the right amount of thread (talk about thread too; it's different than yarn and string). Have your space really organized and think hard about where the kids are going to work. Clean workspaces are a necessity. Once you start losing needles then you have a problem. Be sure to explain to kids that these are tools and materials that we need to keep track of. Magnets are your best friend for keeping track of needles. Be sure to have the right kind of thread for the kids to use. Hand pick needles that have bigger eyes but are still pointy. Don't use blunt needles. "But needles aren't safe" you might say to yourself. You will be very surprised to see what happens when you give kids actual tools like needles. Again, creating a quiet, calm, organized space is key. Hand a kid a single needle and see what they do? Let them simply explore that one tool. Model moving slowly, hand them out one at a time, be sure to get the person's attention before handing them a pointy tool and always carefully put them away. You will be amazed at the silence in the room as twenty or so kids all hold their own needle. They seem to know that they are about to do something real. You are able to tap into something historic, inait, cultural and important...and this is only the first or second lesson. Once they understand how to cut the right amount of thread then have them try to thread the needle all on their own. Again, take note of the sounds in the room. Who is frustrated, who is getting it, who is silent, who is struggling, who is excited??? These are the moments that matter. What kind of assessments can you make at this point? Are there kids who struggle with other things that are now realizing that they can accomplish something? Are there kids who have talked non stop for the past two weeks who are now silent? And once they can all thread a needle then comes the knots. And this can be a complicated step. It's one that requires practice but without it you can't really sew. And maybe we shouldn't refer to it as a knot even, but instead as a beautiful tangle.

All of our left over thread after a sewing session

Tying knots is hard. Teaching how to tie a knot is even harder. But kids should learn how to do it. During all of these lessons I will make sure to tell stories about how I learned to sew; which was while I was working at the MAKESHOP at the Children's Museum. I love talking about learning how to tie knots that are much more akin to tangles. These can be made without even looking at the thread; which was a valuable trait when working in a public space like the Museum. You might be helping one person while simultaneously speaking to someone else while also keeping an eye on another piece in the exhibit. Telling these kinds of stories while teaching shows a true investment in your lesson and also places you in a similar space as the kids...you had to learn how to do all these things too. I never claim to be an expert at sewing either, instead I am happy to try out new things and continue to practice right alongside the kids. After demonstrating the knots, then have the kids practice on their own. This might be frustrating for them but continue to provide as much support as you can. Knowing that tying the knots is an important step provides an incentive that the kids give themselves. When you can get kids to realize that all the steps of a process are important, they become more adept at learning and more comfortable with practice and repetition. These attitudes will hopefully start to transition into other aspects of the classroom.

Once the kids have had time to practice with the knots you can have them all pause. Ask the group, "who is comfortable with all the steps for threading a needle (cutting, threading, knot tying)?" Hopefully you have a couple of kids who are able to do all the steps. It is at this very point that you really

start to form a sewing community. You can explain to the kids that everyone is still going to practice. But now there is a realization that the teacher is not the only source of help in the room. If kids are stuck on something, they can turn to their peers for help. This is the magic of this kind of unit, you can transform the space from a traditional, teacher-centric classroom to something more communal and informal...a space where the kids can help each other and learn from each other, a space where the word "teacher" is not simply relegated to the adults in the room. This kind of environment can be achieved with all kinds of lessons. Sewing seems to work naturally, but if you deep dive into your thinking and planning you can form all kinds of lessons that provide a progression to a much more student-centric classroom.

Oddly enough I have spent the majority of this article talking about sewing without even mentioning stitching that much. Again, it is OK to spend time on each part of sewing. I feel that threading the needle is extremely important and is a step that kids should be able to do on their own. When it comes to stitching, there are lots of ways to give kids the chance to practice. Having them notice stitching patterns on their clothes and shoes is very helpful. Providing them with practice sewing boards (I just punch some holes in rectangles of cardboard and let the kids practice stitching with larger yarn) gives them a tactile experience. Letting them see how the sewing machine makes stitches that are really close together and giving them a large practice canvas or having communal embroidery hoops helps with practicing with actual fabric. Once the kids are comfortable with threading their own needles then these larger practice sewing boards can just be out for free choice. The kids can experiment with stitching, attaching buttons and fabric, and tying end knots. They also get a feeling for pushing the needle through the fabric and some of the estimations you need to make while sewing. During all this time you should be reinforcing slow work, organization, focus, persistence and patience within the whole classroom.

Working at the sewing machine with a student on a Halloween costume

Once this kind of space is achieved then you can start thinking about what you want to make with the kids. They might give you ideas in their practice sewing and exploration. I will say that pockets and pillows were always popular at the Museum. I love to create things that can connect to other subjects; embroidered alphabets are always fun and making sewn room numbers for the whole school is fun. Stuffed animals and puppets can connect with all kinds of lessons. The possibilities can be quite endless. It's up to you and the kids to decide that. But the focus on the process at the beginning is so important to sewing. It can be so transformative for your classroom. It just takes a little bit of time, a little bit of thread and some needles and a lot of planning, patience and persistence. Once again, to hear a kid exclaim, "I tied a knot!" or, "I made a pocket!" or,"I fixed my own problem." To simply hear them say, "I can sew," is always rewarding.

Introduction to Sewing and Sewn Alphabet

Lesson and Time Limit	Activity	Materials	Misc.
Lesson 1: Pre Assessment and Discussion 30 to 45 minutes	Discussion Question: "What is Sewing?" Making Connections to clothing and shoes: "Let's look for examples of sewing." Needle Exploration: Each student gets a needle to closely look at and explore.	Dry Erase Board or Poster Board Class Set of Needles Magnet Board for Storing Needles *See below for Magnet Board explanation Magnet Wands Practice Sewing Boards *If you have time these can used to give the kids some practice with stitching *See Below for details.	*This lesson is all about setting up an organized and quiet space. Be sure to take time to notice the stitching on their clothes and shoes. Remind them about moving slowly and having a nice clear workspace before being given a needle. Hand each student a needle one at a time once they are at a seat or workspace. This gives you the opportunity to model being careful and moving slowly. Listen to what the kids are saying and doing once they have a needle in their hand. If you have created a calm space, the kids should be pretty careful with these tools. Be sure to have the kids practice placing needles back on the magnet board. Challenge them to see if they can make it through all sewing lessons without losing any needles.
Lesson 2: Threading a needle and tying knots 45 Minutes	*Review what we know about needles and remind kids about being mindful and patient during this lesson. Try not to lose any needles. *Show the kids the materials and tools they will be using; needle, thread, scissors. *Ask about how much thread we might need to cut? Then show the kids the measurement technique of getting as much thread as they can get if they stretch their arms out (for younger kids, older kids just need one arm's length). Demonstrate this. *Remind the kids that this is just practice so they don't need to worry about the color of the thread. *Demonstrate how to cut the thread, then hold the needle and show how to thread that. Then show them how to double up the thread and tie a knot (make a tangle) at the end. *Have kids come one at a time to get thread and a needle then they can try threading them at their workspace.	Dry Erase Board Class Set of Needles Magnet Board Magnet Wands Practice Sewing Boards *If you have time these can used to give the kids some practice with stitching Spools of Thread	*Have all materials organized and ready to work with. *Remind kids to move about the space carefully and quietly. *Once everyone has their materials then you can start to circulate the room. Gauge frustrations levels. Only help when needed. *About half way through have kids pause and take a quick survey of hands of who is able to: Cut thread? Thread a needle? Tie a knot? *Taking this survey allows kids to start to realize who else they can ask for help if they are stuck. *Listen to what the kids are saying.

Lesson and Time Limit	Activity	Materials	Misc.
Lesson 3: Practicing Stitching 30 Minutes	*This project works best in smaller groups if you can do that. *Show kids the practice sewing boards and large sewing stations. Go over some basic rules and remind everyone to work slowly. Let the kids get their needles and let them pick thread. Give them all time to thread their own needles and tie nots. Then let them explore stitching into real fabric. They can attach buttons and pieces of fabric. You can just monitor things and give kids help who need it. Feel free to have kids pause working to point out interesting things or answer questions. Have everyone help clean up when finished. The kids can also use practice boards to get used to the motion of stitching up and down.	Class Set of Needles Magnet Board Magnet Wands Practice Sewing Boards Spools of Thread Practice Sewing Boards *If you have time these can used to give the kids some practice with stitching buttons Large Embroidery Hoops Large Fabric Frame *See below for more details	*The practice sewing boards can always be used to help kids better understand stitching without wasting thread or using metal needles. This can be more independent for the kids. *This is a great time to teach them how to tie a knot at the end of your stitching. Teach them to leave enough thread to tie a knot using the needle.
Lesson 4: Embroidery Hoops and Project Preparation 30 Minutes	Introduce the embroidery hoops and see if any of the kids know about them. Explain why we are using them (help us keep our fabric flat). Demonstrate how the hoops work (sandwich fabric between circles, carefully turn bolt, check to see if everything is tight). Then have the kids explore the hoops for a few minutes. Then explain that we will be sewing an alphabet and they can pick out their background fabric. Give them time to pick out their fabric and then let them try to install their fabric into their hoops. Label each hoop with the kids' names and letters.	Class Set of Small Embroidery Hoops (you can use larger ones too) Felt cut into pieces that can fit the embroidery hoops List of ABCs and Kids Labels or Tape	*You can cut off excess felt or fabric from the hoop to make it easier to sew. *Have labels already made. *Have a storage bin ready to keep everything organized. *Choose letters that are appropriate for kids based on their sewing skills and handwriting skills. Ex. The letter "I" might be easier for someone who is struggling.

Lesson and Time Limit	Activity	Materials	Misc.
Lesson 5: Review 30 Minutes	Go over everything you have learned over the past few days. Give the kids the chance to practice cutting thread, threading needles, tying knots and stitching.	Dry Erase Board Class Set of Needles Magnet Board Magnet Wands Practice Sewing Boards *If you have time these can used to give the kids some practice with stitching Spools of Thread	*Try to keep track of which are getting it and can work independently. Utilize them to help with classroom management when other kids need help.
Lesson 6: Introduce Project and start patterns 45 Minutes	Introduce the ABC project to the kids. Go over the steps (thinking about letters, getting materials ready, sewing, displaying work). Show your example that you have started to work on (I usually pick the letter "Q" because it can be tricky to sew those shapes). Take questions from the kids. Organize materials and make sure workspaces are clean and organized too. Have kids start to gather materials. They should take their time to either draw out their letters on their fabric or start to cut out fabric letters. Pin letters onto fabric so that pieces don't get lost. Have everyone clean up. Then gather back to talk about what everyone worked on.	All Sewing Materials -Needles -Thread -Magnet Board -Pins -Scissors -storage bins Extra Felt (organized) -Embroidery Hoops -List of kids and ABCs -Example Letter	*Have all materials organized and model how to be careful and mindful of materials. *Have an example letter started. Create one that is embroidered just with stitching (Upper Case) and another that is made with a separate piece of felt (Lower Case). *Create a quiet space and have the kids slowly get materials and make sure that everyone has a clear workspace.
Lesson 7-9: Work on Project 45 Minutes	Continue to start lessons with all materials organized and get the kids in a calm and patient mood before starting to work. Give the kids time to speak about their work. Keep track of where kids are at. Help kids who seem frustrated. Provide spaces for independence, struggle and peer-to-peer learning. Celebrate all work no matter what it looks like.	All Sewing Materials -Needles -Thread -Magnet Board -Pins -Scissors -storage bins Extra Felt (organized) -Embroidery Hoops	*Remind kids of anything that was noticeable on the day before. Answer questions. Share stories. *Have something for kids to work on when they finish. They can become helpers, sew on the practice boards, etc.
Lesson 10: Reflection 30 Minutes	Continue to celebrate the kids' hard work on this project. Go over questions and give the kids time to reflect on all that they experienced.	Finished ABCs Review Sheet Pencils	*Let the kids know that their answers will help populate the display of these projects.

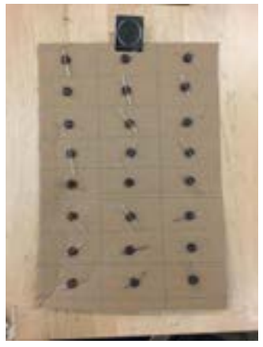
Lesson and Time Limit	Activity	Materials	Misc.
*Display	Share the kids' work with other classes and hope to inspire others to try something hands-on.	Finished ABCs Practice Sewing Board or Practice Hoops Photos Reflections from the kids and quotes about the experience	*Try your best to show the entire process of the project. *Consider adding a writing component utilizing each kids letter (kind of like an ABC book) *Consider turning the flat pieces into ABC pillows. *Figure out what sewing project you want to do next.

Magnet Board

The Magnet Board will help you keep track of your class set of needles and help instill some responsibility in your students. The visual impact of the board helps you quickly realize if a needle is missing or not. You can label each spot with a kid's name but it actually seems more communal to have no names just the magnets. You can also use it again the next time you teach sewing with a new group of kids. The kids will happily try to fill the board back up after a sewing session. This really does help with the management of these materials and keeps them out in the open for kids to see and understand that sewing is still happening in the classroom.

What do you need:

- class set of small cylinder, ceramic magnets.
- Piece of cardboard
- Hot glue gun
- Yardstick
- Marker
- Class set of needles
- Magnet Wands



Large Fabric Screen

The fabric screen will provide a space for multiple people to practice stitching at the same time. You can use large embroidery hoops for this too, but the bigger the size the more people can work at once. This activity provides a space for kids to freely practice stitching with metal needles through fabric. This helps them get the feeling for stitching. You can observe and help with this activity and then use it as a talking point for sewing techniques or mistakes that have been made. Participants should be encouraged to still thread their own needles and clean up after themselves when finished. There can be a theme to what the kids are stitching or attaching (certain shapes, letters, animals, patterns, etc.) or it can be left completely open. The screen can eventually be put on display or you can just keep adding to it for as long as you want.

What do you need:

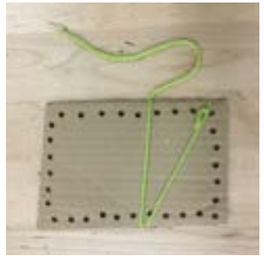
- Wooden Frame (Approx 3 ft. by 4 ft.)
- Large piece of fabric
- Clamps
- Power Drill
- Saw
- 2x2 lengths of wood
- Wood Screws
- Needles
- Thread
- Buttons
- Scissors
- Scraps of Fabric or Felt

Practice Sewing Boards

Practice Sewing Boards are really helpful for providing an activity that helps students get used to stitching. These provide a low-cost way of allowing students to make mistakes in stitching. You can easily pull the stitches out and try again. Practicing over and over with these allows students to get a good understanding of the process of stitching up and down along a preset path. These can simply be made with cardboard and yarn. Simply punch a path of holes around the perimeter of the board. Putting some tape around the end of the thread acts as a very simple needle (plastic needles can be used too). These can also be great for demonstrating stitching as they provide a larger visual for students to see. You can add more holes or provide different shapes as well. The pieces can also be sewn together to create more 3D shapes.

What do you need:

- cardboard rectangles (about 6 inches by 4 inches)
- Or pegboard pieces cut to a similar size
- Hole punch
- Yarn
- Tape
- Scissors
- Plastic Needles (optional)



*Feel free to space these questions out to provide room for words and drawings. And feel free to add or remove questions too.

Sewing Survey

Name:

What are some of the tools you use when sewing?

What do you like about sewing?

What was difficult or hard about sewing?

What did you need help with when sewing?

How did you feel while sewing?

How did the classroom feel?

What are some other sewing projects that you would want to do?

Author Biography

Kevin Goodwin has worked at the Falk Laboratory School for the past several years teaching in a loop with 1st and 2nd grade students. Prior to that he worked at the Children's Museum of Pittsburgh in the Education/ Learning and Research Department. He has worked in traditional learning environments as well as informal learning spaces. Kevin has a Masters in Early Childhood Education from Carlow University and is a member of the Agency by Design; a research group through Harvard's Project Zero and is located in Pittsburgh. Kevin loves teaching and considers himself a life-long learner.

Makerspace: Engaging K-12 Learners and Growing a Society of Critical Thinkers and Innovators, A Qualitative Examination

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Abstract

This study examined makerspace pedagogical practices and how during the pandemic it influenced learning within the virtual setting. The teacher candidates designed makerspaces that were shared with elementary students and their families. Preliminary results supported that the pedagogical practices were aligned with constructivist theoretical framework. The results further supported that elementary students and families who had participated in making and tinkering during the makerspace activities learned and collaborated within the disciplines of STE(A)M. This study has several implications including an increase in learning through sensemaking in an at-home makerspace challenge, understanding makerspace pedagogical practices, and how teachers can influence students learning in either a virtual or face-to-face setting. In addition, schools should provide support for teachers utilizing makerspaces if they are to succeed in instilling the maker mindset as well as partnering with families in using a Makerspace Challenge.

What Is A Makerspace?

Makerspace is an emerging classroom pedagogy involving students of all ages in order to encourage critical thinking, problem-solving, creation, and innovation through science, technology, engineering, arts, and math (STEAM) education (National Inventors Hall of Fame, 2021). The basis of makerspace lies in curiosity and inquiry about a challenge, problem, or question that needs to be solved. Beginning by blueprint-writing, students hypothesize a method to solve, answer, or counteract. After gathering a plan, the students then transition to building a physical model of their proposed solution. At the elementary level, building is frequently made from recyclable materials and craft supplies while in the upper grades, students may have access to more advanced technology such as 3D printers and power tools (Make Media, 2013). Once built, students have the opportunity to test their model to see if their solution would work under realistic conditions. The testing procedure involves physically putting the student's model under the problem conditions that beg a solution. For example, if a student built a model to protect a raw egg from cracking when dropped from a height of ten or more feet, the test would involve physically dropping the egg with the model from ten feet off the ground to test the viability of their hypothesized solution. If the solution shows weaknesses and does not pass the testing procedure, the student is required to go back, revise, and rebuild their model until they create a solution that passes testing.

The Maker Movement

The makerspace pedagogy is an evolutionary product of *Make Media*, a platform designed to connect innovators and share ideas. Dale Dougherty, the founder and CEO of Make Media and the "godfather of the Maker Movement" (Maker City, 2021), launched several branches of Make Media in 2005 including MAKE Magazine and Maker Faire. These platforms allow creators and innovators from around the world to share ideas, present their findings, and collaborate with one another. As Make Media's platforms grew, momentum for the Maker Movement took shape and people all around the world were becoming makers through initiative, motivation, and collaboration. The goal of the Maker Movement is to encourage creative thinking, innovation, problem-solving, and to develop new technologies that address issues presented in our ever changing world.

Four years after Make Media was launched, former President Barack Obama launched an initiative in 2009, Educate to Innovate, that targeted science and math achievement in American students over the course of the following decade. Obama allocated over $700 million into the growth and development of STEM education across the nation. The initiative focused on preparing educators in the areas of STEM instruction and creating a diverse pool of STEM interest and participation among the U.S. population. Smaller non-profit organizations such as Change the Equation, a coalition that gathers CEOs of businesses to encourage "making", and 100Kin10, a coalition addressing issues relating to a shortage in the number of STEM teachers, were launched and contributed to the continual build in momentum for the Maker Movement (The White House, n.d.).

In 2018, Pennsylvania Governor Tom Wolf invested $40 million into a new initiative titled *PASmart*, which strives to "help prepare students and workers for the jobs of today and tomorrow" through providing resources, training, apprenticeships, and careers within the STEM disciplines (PASmart, n.d.). Additionally, in 2020, Wolf committed to advancing science and technology instruction for students. He supported the expansion and updation of the academic standards from two sets of standards, last updated in 2002, to three sets of more in-depth, detailed standards that will better guide educators in scaffolding instruction for higher level student understanding ("Governor Wolf: modern science education standards and PAsmart will prepare students for good careers in Pennsylvania", 2020). Ultimately, the Maker Movement is still growing and becoming more widespread as school districts and state and federal agencies stress the importance and comprehensive development of STEM education.

An Authentic Approach to Science

The most effective scientific instruction utilizes authentic, real-world examples and applications. Authentic experiences allow students to see how their content directly applies to or impacts the world around them. While engaged in a makerspace activity, students are often intrinsically motivated to develop a practical solution and feel autonomy over their project. Authentic experiences, such as makerspaces, encourage engagement, interest, and the development of critical 21st century skills such as problem-solving, innovation, collaboration, and creativity. Directly applicable is American Psychologist Jack Mazirow's Transformative Learning Theory which describes how an individual interprets their own experiences and shapes their view of the world based on the perceptions of their experiences. A makerspace provides students with the opportunity to interact with authentic experiences and analyze the outcomes, setting the foundation for perception building. It is explained that "Transformative learning is a process of examining, questioning, and revising those perceptions," (Taylor and Cranton, 2012), similar to the procedure of a makerspace. Makerspaces aid students in developing a comprehensive understanding of the world around them.

Virtual Application by Pre-Service Teachers in Pennsylvania

Beginning in March 2020, teachers and students were faced with challenging teaching and learning conditions as the Coronavirus (COVID-19) disease was rapidly spreading across the world. In many states, schools were forced to halt in-person instruction and switch to virtual teaching and learning. On April 1, 2020, Wolf signed an executive order that put the entire state of Pennsylvania under stay-at-home orders ("Gov. Wolf, Sec. of Health: Pennsylvania on statewide stay-at-home order beginning at 8 pm tonight, "most prudent option to stop the spread"", 2020). This left teachers and learners with the daunting task of instruction from the comfort of their own homes.

The purpose of this examination was twofold. The first purpose was to determine if working with makerspaces in a virtual setting positively affected the attitudes of elementary students in the areas of STE(A)M. The second purpose was to explore how using makerspaces could help learners become fluent in 21st century skills and help set the "make mindset." (Dougherty, 2013, p. 9). More specifically, do students feel an increased level of comfort to approach STE(A)M with more confidence? The makerspace movement has the potential to foster and promote creativity, problem-solving skills, and collaboration with families and teachers, which is vital to succeed in the 21st century environment.

Three professors in the Shippensburg University Teacher Education Department took advantage of the statewide school closures to teach their college classes of pre-service teachers one way to reach students academically in a virtual setting. The faculty members collaborated in creating a makerspace assignment that would incorporate content being learned in the *Science and Technology Methods* course as well as the *Math Methods II* courses. The assignment asked the pre-service teachers to develop a makerspace lesson plan. Additionally, the professors collaborated with the director of the Grace B. Luhrs University Elementary School, Shippensburg University's on-campus lab school, to discuss a partnership in sending the completed makerspace lessons home to the elementary students and their families. The lab school director was excited by the idea and created a school-wide "Makerspace Challenge" among students which begged the question, *Who could complete the most makerspaces during the month of April?*

The planning process was very structured. After learning about the pedagogy of makerspace, the pre-service teachers chose a grade band (K-1, 2-3, or 4-5) and ensured that there was equal coverage. They were given a lesson plan template to guide them through the steps of designing a comprehensive makerspace, writing a letter to families explaining the challenge, and aligning the activity to both science and math academic standards. From there, the pre-service teachers were given the creative freedom to design their makerspace activity. Designing the activity required the pre-service teachers to

be mindful of the supplies available to students at home, the reading level and vocabulary appropriate for each grade band, and the amount of adult guidance or supervision that the activity may require in relation to a wide variety of support systems that students may, or may not have, at home. A shared document allowed every pre-service teacher to add the link to their makerspace activity; this document was shared with families for access to the lessons.

Grace B. Luhrs University Elementary School Makers

Many students took part in the Makerspace Challenge. The challenge excited families and gave them a fun, hands-on activity to work on with their children. The students seemed to view the makerspaces more like play than they did academic content! Families submitted photos and videos to the school of their children's success in makerspaces which were shared in a variety of platforms for others to view.

Marble Challenge: Build a marble run that travels the whole way down to the bottom of the box as fast as possible.


Humpty Dumpty Egg Drop: Create a contraption that will protect a raw egg from cracking when dropped from at least 10 feet.


Tower Challenge: Who can make the tallest paper tower? Create a tower using paper products and tape.



Float Boats: Construct a boat from recycled or craft materials that floats in a bowl of water.

Flood Barriers (Sample Lesson)

The following lesson was used as a "take-home" lesson. Students were given explicit step-by-step instructions to guide them through the activity independently.

Flood Barriers Makerspace
Author: Courtney Graf

Grade: 3-4

Objectives:

1. Students will be able to accurately identify the impacts that floods have on buildings when analyzing and reflecting on the testing procedure results.
2. Students will be able to accurately pinpoint flaws in their model when given a reflection question.
3. Students will be able to accurately label angles (acute, right, and obtuse) after completing their blueprint drawing.

Next Generation Science Standards:

- 4-ESS3-2 Earth and Human Activity: Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.
- 3-4-ETS1-3 Engineering Design: Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model of prototype that can be improved.

Common Core Universal Standards (Math):

- CC.4.G.1: Draw points, lines, line segments, rays, angles (right, acute, and obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

Resource: Davis, C. (2020, September 16). The Great Flood Barrier Experiment. Retrieved from https://teachersareterrific.com/2017/06/flood-barriers.html

Materials

Printed Blueprint, Flood Testing, and Instructions Sheets
Pencil
Scissors
Glue/Tape
Large flat dish/tub
Water
Measuring Cup (1 Cup)
Food Coloring
Any materials—craft or household (examples include: playdough/clay, pipe cleaners, cardboard, empty water bottles, paper towels, toilet paper rolls, newspaper, straws, egg cartons, cotton balls, coffee filters, rubber bands, yarn, etc.) —you can use anything! Be creative in what you find!

Knowledge Activation

https://youtu.be/4PXj7bOD7IY

Flood Barriers

Oh no! Did you hear that? The news channel just announced that Hurricane Vetock-Root is heading to Shippensburg! A lot of the houses sit on the ground and many even have basements that make them more likely to experience flooding. Let's make sure that your house doesn't get flooded!

Your challenge: Build a model to protect your house from floodwaters.

Step-By-Step Instructions

Preparation: Gather all of your craft materials that you plan to or might use prior to beginning. Get creative - walk around your house and use anything you think of!

❶ **Designing Your Town**—read all directions before starting

1. To design your town, grab your "My House Graphic Organizer Blueprint" paper (below) and a pencil. What you draw on this blueprint will be your building plan, so think wisely! Begin by drawing your house in the middle of your blueprint paper.
2. Then, look at the materials you have gathered and begin to design how you will use those materials to protect your house from flood waters. Draw in your materials and ideas on your blueprint in the places that they will go when you build.
3. If you wish, you may label your drawing so you remember where everything goes when you go to build!

Requirements: Your house must sit on the bottom of the dish/tub. Your house must be in the middle of the dish/tub. You must be able to easily pick up your house. In your blueprint design, you must draw (and label) **one acute angle**, **one right angle**, and **one obtuse angle**. This can be done in where you place your materials, in drawing your house, or anywhere you see these angles!

Special Requirements (checklist):

- ☐ Can you easily pick up your house?
- ☐ Is your house in the middle of your blueprint?
- ☐ Did you draw and label **one acute angle**?
- ☐ Did you draw and label **one right angle**?
- ☐ Did you draw and label **one obtuse angle**?

My House

Graphic Organizer Blueprints

Name:

Blueprint (Draw out your design plan to keep your house dry. Make sure to include and label **one acute angle**, **one right angle**, and **one obtuse angle**!)

❷ **Building Your House**

1. To begin, print out the worksheet (https://docs.google.com/presentation/d/1v1bxuX3PKSo3nYowioO4x7IIJqoDybeI_dbBDbzFaLw/edit?usp=sharing) and follow the diagram to assemble your houses using scissors and glue or tape. Make all 3 houses!
2. Once your houses are assembled, you are ready to move onto building!

❸ **Building Your Blueprint**

1. To start building, grab your dish/tub and place one house in the middle. Then, by looking at your blueprint, begin building your design to keep your house safe and dry from the flood that is coming!
2. When you have finished building your blueprint, your design is ready for testing!

Remember:

- ☐ Your house must be in the middle of the bucket
- ☐ Your house must be sitting on the bottom of your bucket
- ☐ You must be able to easily pick up your house

❹ **Testing**

- Testing will consist of 3 tests. Our test is working to answer the question, ***"Can my house withstand floodwaters?"***

1. Place your dish/tub on a level, flat surface such as a table or floor.
2. Grab your "Flood Testing" paper. (below)

Flood Testing

Can my house withstand floodwaters?

Complete Test 1. Pick up your house and inspect it.

1. If your house is the color of your food coloring, your house has flooded. Ask yourself "What went wrong?", "Where did the water get in?", and "How can I change my design to fix this problem?" Go back and edit your blueprint making some changes to your design. After you redesign it, rebuild with your changes and retest Test 1. Always start new tests with no water in your dish/tub. You will need to dump out the water you poured in.
2. If your house is dry, congratulations! You made a design that protected your house from a **small** storm! "What part of your design do you think saved your house the most?" Continue onto Test 2.

Test 1: Put a few drops of food coloring into 1 cup of water and then pour the water into your dish/tub.

Did your flood barrier keep your house dry? (circle one) YES NO

If water got in, *where did it get in?*

_____

_____

If water got in, *how would you change your design to not let any water in?*

_____

_____

If water did not get in, *what part of your design saved your house the most and why?*

_____

_____

Note: After 3 unsuccessful tests, you may move to the Test 3 "If water got in…" questions.

Complete Test 2. Pick up your house and inspect it.

1. If your house is the color of your food coloring, your house has flooded. Ask yourself "What went wrong?", "Where did the water get in?", and "How can I change my design to fix this problem?" Go back and edit your blueprint making some changes to your design. After you redesign it, rebuild with your changes and retest Test 2. Always start new tests with no water in your dish/tub and a new, dry house. You will need to dump out the water you poured in.
2. If your house is dry, congratulations! You made a design that protected your house from a **medium-sized** storm! "What part of your design do you think saved your house the most?" Continue onto Test 3.

Test 2: Put a few drops of food coloring into 2 cups of water and then pour the water into your dish/tub.

Did your flood barrier keep your house dry? (circle one) YES NO

If water got in, *where did it get in?*

If water got in, *how would you change your design to not let any water in?*

If water did not get in, *what part of your design saved your house the most and why?*

Note: After 3 unsuccessful tests, you may move to the Test 3 "If water got in…" questions.

Complete Test 3. Pick up your house and inspect it.

1. If your house is the color of your food coloring, oh no, your house has flooded. You may continue testing until you create a design that keeps your house dry or you may create a hypothesis as to what is going wrong in your design and why it is letting water in. This hypothesis can be used in future tests.
2. If your house is dry, congratulations! You made a design that protected your house from a **large** storm! For fun you may, slowly pour more water on your house one cup at a time to see just how much water it takes to flood your house!

Test 3: Put a few drops of food coloring into 3 cups of water and then pour the water into your dish/tub.

Did your flood barrier keep your house dry? (circle one) YES NO

If water got in, *where did it get in?*

If water got in, *what is your hypothesis about what went wrong with your design? (example: If there are holes in the design, then water will get in.)*

If water did not get in, *how many cups did it take to flood your house?*

Results and Implications for the Future

According to Wagner (2008), teachers today must strive to teach their students problem-solving skills to help students with future learning. Teachers can systematically collect data from students to make informed and intentional future lessons too. Elementary students need to employ making sensible decisions in everyday life and STE(A)M makerspaces can support this development. Pre-service teachers also must strive to teach in a variety of settings as exemplified by the quick transition from in-person to virtual instruction during the COVID-19 pandemic. The makerspace approach challenges students to be problem solvers and to impart critical thinking skills provides an avenue for learners to develop improved thought processes, in-depth analytical thinking skills, higher levels of concentration, systemic perspectives, and curiosity (Wagner, 2008). If elementary students are to be future adult competitors in the global market, skills such as critical thinking, creativity, and collaboration are essential in the workforce. To be prepared for the future, elementary students must be innovators and challenge themselves to apply STE(A)M in solving problems, and designing products that will serve the community. (Petrich, M., Wilkinson, K., & Bevan, B. 2013).

In highlighting the pedagogical practices of the Makerspace Challenge during the pandemic, both teacher candidates and teachers of the Grace B. Luhrs Elementary School were able to pioneer how to not only reach students virtually, but also connect families to the school in collaborating in the Makerspace activities. What resulted from the Makerspace Challenge was a future of leaders in the field of education as well as an excitement of STE(A)M within K-5 learners. Due to this unique approach to the nature of makerspace, teacher candidates had to provide a means to connect to students who they never met or saw. The idea of challenging the elementary students to do the makerspaces at home as well as share videos and pictures is what redefined learning. Makerspaces provide students with the freedom to innovate which is what fostered collaborations and communication among families via various social media platforms. A photo wall in the school was also dedicated to celebrating the success of the elementary makers. Parents reported how excited their children were in completing the Makerspace challenges as well as the fun they had supporting their children. Makerspaces can change the way educators envision teaching and learning. This movement contends that making, which is an active process of building, designing, and innovating with tools and materials to produce shareable artifacts, is a naturally rich and authentic learning trajectory (Martinez & Stager, 2013).

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Author Biographies

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The Laboratory School: Its Rise and Fall? An Excerpt

William Van Til
INDIANA STATE UNIVERSITY

The Dream of the Laboratory School

What was the vision of the proponents and supporters of the campus laboratory school in twentieth century America? It was a brave dream.

Within a shining new building on the campus of an institution of higher learning, children and youth who were representative of the American population would experience the finest possible education. Their learning experiences would be derived from the application of the tested best already established, and from experimentation with the newest and most venturesome approaches to education.

The laboratory school faculty would be made up of master teachers demonstrating their skills in the art and science of teaching, carrying forward research and experimentation with children and youth, and adroitly inducting observers, participants, and student teachers into the best of all possible educational theory and practice. Their partners in the school would be the college and university professors. The professors would artfully interweave their classroom instruction with extensive observation, participation, and student teaching in the demonstration school by teachers to be. The professors also would share in the development of significant research with the experimental school faculty.

To this center of educational enlightenment would journey educators from near and far to observe the best in education. They would then return to their schools to put new ideas into practice, thus raising the level of American education. The laboratory school would be the pride of the college and university administration, the joy of parents fortunate enough to have young people enrolled therein, and the darling of state legislators, boards of trustees, and philanthropists.

It was a brave dream. It was a good dream. What happened to it?

The Conflicting Perceptions

Inherent in the dream were conflicting functions proposed for the laboratory school and conflicting perceptions on the part of human beings who were involved. Let us consider the actors on the stage on which the drama of the laboratory school was played. They included laboratory school students, their parents, the professors in the institutions of higher learning, the laboratory school faculty, the funding sources, and the laboratory school administrators. Let us examine their roles and perceptions.

The Students

Consider first the campus laboratory student, who, strangely enough, is seldom discussed in the literature concerning the laboratory school. The student is usually "special" rather than "representative." He is admitted by application. He is usually more prosperous or bright or problem-prone than his age group in the American population. Sometimes he has two or even all three of these characteristics.

According to the old proverb, money is the root of all evil. Possibly so. At any rate, the solutions adopted to obtain needed financial support for the campus laboratory school partially accounted for the skew in the distribution of the student body in the typical laboratory school. More plainly, since tuition was charged in many laboratory schools, these laboratory schools were attended by those who could afford to pay tuition. E.O.F. Williams' The Actual and Potential Use of Laboratory Schools, published in 1942 and based on data from 1933-34 and 1937-38 surveys, reported, "in 23.7 percent of the teacher colleges which maintained campus schools, tuition is charged pupils in the schools."[1] But analysis of Evan Hugh Kelley's AACTE publication, College-Controlled Laboratory School in the United States—1964 shows that by 1964 45 percent of laboratory schools charged tuition. The thirty-year trend is toward, not away from, tuition. So, one skew distorting the classic bell-shaped curve about which we all learned in Psychology I was economic selection.

A second skew in the bell-shaped curve related to the intellectual ability of the members of the student body. The laboratory school was often regarded as particularly appropriate for the bright. Some laboratory schools were designed especially for the gifted. In addition, many environmental factors account for the intellectual head start often enjoyed by the young people from relatively prosperous families in American life. So, the bell-shaped curve as to the range of intellectual ability developed a sizable hump reflecting the gifted and bright members of the student body. The curve sagged somewhat as to students of "average" or "normal" intellectual ability. The middle group often was less evident in the laboratory school than in a characteristic comprehensive public school.

Less commented upon, but still evident, was another hump, often somewhat smaller than the intellectual hump—those students who, because of a variety of emotional, social, physical, and intellectual factors, were not doing as well as their parents had hoped they would. ("What should we do with George? We've tried the public school, the private academy and the military school. Let's try this new school at the university"). Consequently, so-called problem students were often disproportionately represented in the student body.

Consequently, the bell-shaped curve was often replaced by an outline resembling the camel with a large hump, a sag, and a smaller hump, representing, respectively, high intellectual ability, average characteristics, and problem proneness.

The economic and intellectual and problem skews have contributed to the ambiguity with which laboratory school students have often viewed their school. Laboratory school students frequently enjoy their "special" status and are sometimes fiercely loyal. But they do not want to be so special as to be regarded as "different" (sometimes as snobbish, sometimes as eggheads, sometimes as weird) by their social class contemporaries attending public or private schools in the community.

The dream assumed that the student body would be representative of the American population. But the student body was skewed economically and intellectually and skewed with respect to special problems of the student population. The dream assumed that social pressures would not affect student reactions to the laboratory school. But the students, unable to escape surrounding social pressures, had to contend with outside opinions. Student reactions ranged from strong defense of the laboratory school to requests for more formal grammar in the curriculum.

The Parents

How did the characteristic parents of the laboratory school students perceive the laboratory school? Their predominantly upper class or upper-middle class backgrounds were often influential factors in their perceptions. They frequently were sophisticated in their understanding of the interrelationships among social class, attendance at certain educational institutions, and success in life. They wanted the best for their children, and the best included a school better than the run-of-the-mill schools of their communities.

Though inclined to some degree of improvement in the laboratory school program over the conventional school, the parent of a laboratory school youngster often viewed with considerable doubt, and sometimes with alarm, the research and experimentation functions of laboratory schools. He did not want "my child being used as a guinea pig for purposes of educational experimentation." He even viewed with distinct reservation "young teachers in training practicing on my child." The characteristic laboratory school parent learned to keep a cautious weather eye upon his primary goal for his child, entrance into a good college, preferably "the college of choice." And, especially when writing a substantial check for tuition, it was hard for some parents to see the laboratory school as other than another private school. (There have even been laboratory school teachers and administrators who confused laboratory schools with private schools!)

The dream assumed that the parents would be representative of the American population. Like their children, the parents often were not representative. The dream assumed parental congeniality to experimentation and to the school as a laboratory for future teachers. But parental inclination to innovation was sharply reduced when accompanied by upper-income perceptions and especially by the fears surrounding college admission for their loved ones in eras marked by college entrance panics. So, parents were often a brake upon some aspects of the dream.

The Professors

And what of the relations of the professors in the sponsoring college or university to the so-called "college-controlled" laboratory school? In some cases, the street on which the laboratory school was located was the widest street in the university world, for it separated the laboratory school from the rest of the university. We can readily understand why that street seemed wide to the liberal arts faculty and to the faculty of certain specialized schools like medicine or engineering within the university. After all, the laboratory school was not "their baby." But sometimes even those who worked in the neighboring building, the school of education, failed to cross the wide street. Yet the laboratory school definitely was "the baby" of the education faculty. Indeed, they may have been part of the trouble.

The initiating force in the creation of the laboratory school was often the education faculty, whether through normal schools, teacher colleges, institutes, state university, or land grant colleges. Some of the faculty members were particularly active on behalf of the establishment of a laboratory school. Many documents were prepared by education faculty members which eloquently pointed out the imperative need in the

teacher education enterprise for a laboratory school. Deans of schools of education, or their equivalents in other forms of teacher education organization, often took many lonely walks to and from meetings concerning the university budget before a laboratory school was authorized by the trustees. So, when the baby was born, there was rejoicing and applause in the school of education and, figuratively, dancing in the street that was assumed to connect (not separate) the laboratory school and its parent school, the school of education.

It is generally assumed that the responsibility of parents is to rear their children. But parents do not always agree on child-rearing practices. This is particularly true of individualistic professors when cast in the role of parents of institutions. And there are some parents, too, who abdicate, taking no interest whatever in the child. They have their own concerns. So, it was with the professors of education.

In the early twentieth century, the conflict as to functions was less sharp, for the laboratory school was commonly justified as the place for student teaching. But with increased enrollment in teacher education, student teaching moved increasingly away from the campus laboratory schools and into cooperating public schools.

In more recent years, some professors in the schools of education have seen the laboratory school as the locale for trying out their favorite theories or conducting their chosen research. Some have seen the laboratory school as an opportunity for observation and participation by college students. Other professors still saw the laboratory school as the place for student teaching.

But there was a conflict among these functions. A school stressing student teaching, or even a school stressing observation and participation, may not provide a suitable atmosphere for theory development or research. Conversely, a school environment conducive to extensive theory development and research undertakings may not readily accommodate substantial numbers of student teachers, participants, or observers, each intent upon doing his own thing, as today's phrase puts it.

The dream contemplated no conflict between the functions of student teaching, participation, and observation, and the functions of professors and laboratory school faculty members carrying through experimental research and theory development. But, in reality, the conflict existed. The supremacy of one or the other of the groups of functions widened the street even further for some among the professors of education. But the greatest miscalculation of all on the part of the professorial fathers was failure to realize that babies soon grow up and reach for and achieve relative independence.

The Laboratory School Teachers

Which brings us to the laboratory school teachers themselves. Laboratory school teachers usually have had no intimacy with the courtship or, indeed, the love affair of the teacher educators out of which the laboratory school was born. They have had no personal experience with the long process of gestation. When laboratory school teachers arrived on the scene, the laboratory school was there. The laboratory school teacher often found himself teaching in a school which, so far as the staff member knew, might have spring like Minerva full grown from the brow of Zeus. His job? To teach well.

Basically, the commitment of the laboratory school teacher is to good teaching. His major responsibility is for the development of a group of young human beings. As a good teacher, his loyalties are to his students. His other responsibilities seem to him subordinate (though often overwhelming) expectancies. V.L. Replogle and J.W. Carrington have described such expectancies dramatically in the 1955 Association for Student Teaching Yearbook, Functions of Laboratory Schools in Teacher Education. They point out that "the supervising teacher is caught in innumerable squeeze plays. He feels responsibility for so many things and to so many individuals. He needs to be here when he should be there. He must miss this committee meeting so he can attend that one. He needs to have a conference with his pupil, his student teacher, the college instructor, and perhaps a parent who came in unexpectedly. Oh, yes, thirty observers tomorrow at ten! I need more teaching time. How can I find time to keep a cumulative record for both pupils and student teachers? There are so many things to be done and so little time to do them. How did Stephen Leacock ever jump on that horse and ride off in all directions? I must talk at tonight's P.T.A. meeting."[3]

The laboratory school teacher learns that he should carry on research based on his work with the students. But often he is having enough problems attending graduate classes and working for his advanced degrees, enabling him to leave the laboratory school and become an "educational leader." He learns that he should enter into research partnerships with the professors. But often he is having enough difficulty meeting their professorial requirements in their classes which he attends. Moreover, they do not always seem to be interested in what interests him; and he prizes his freedom to teach, his freedom to use his own style and approaches. He usually wants to be not only a good teacher but also an experimental and innovative teacher. However, this latter role does not seem to him to necessarily involve research. He knows that the school is a place for him to help student teachers, participants, and observers. But he welcomes outsiders most when they can help him do a good job with his students.

It is a rare laboratory school teacher who has not had his occasional heretical doubts about the wisdom of parents or the practicality of professors of education. Most laboratory school teachers have had their moments when they mistrust the parental upbringing of some of the students in their classes. Occasionally, they have even suspected that the professors of education would be quite baffled if confronted by real live children or adolescents especially the laboratory school teacher's own classes.

The dream assumed that the laboratory school teacher could combine the roles of master teacher, research partner with professors, and mentor to hordes of visitors. The reality is that, of all these roles, the laboratory school teacher sees himself fundamentally as. A good teacher who is developing experimental innovative programs.

Consequently, when a statement of functions of the laboratory school is drawn up, the laboratory school teacher places high, usually first, the provision of an outstanding educational program for the children and youth who attend the school. The provision defends his perception of his role.

Just as it seems hard for many professors of education to cross the street, the laboratory school teacher recognizes early that it is hard for a laboratory school teacher to achieve full first-class citizenship in the university world of scholars. It often seems to him that others are authorized to go to the important out of town meetings, that university decisions are made without his participation, and that, in general, he is tolerated as a second-class citizen of the university rather than fully accepted.

As A.R. Mead puts it in Functions of Laboratory Schools in Teacher Education, "By and large, what has been done to these workers and about them has been a shame and disgrace to the profession. They have been paid smaller salaries, asked to achieve the same standards of preparation as other college staff members, not allowed to have faculty rank in many cases, not allowed to share in faculty deliberations in most cases, sometimes sneered at by persons who should know better, and often 'encouraged' by their 'superior' administrators to 'get out of the laboratory school and teach courses in education!'"[4]

The Funding Sources

And what about the sources relating to funding, aside from the tuition-paying parent already described? How do legislatures, boards of trustees, and university administrators see the laboratory school? These fund-related sources have the ungrateful task of trying to make a judgment as to the relative value of each aspect of sizable college or university operations. Even more difficult, the fund-related agencies must translate their judgment into dollars and cents.

When the laboratory school is justified to them through pleas for support, it is in terms of the student teaching-participation observation functions and the research-experimentation functions. There is no dean in recorded history who ever attempted to justify a laboratory school to the funding sources as an institution affording employment to deserving elementary and secondary teachers. Should other sources of information persuade the funding agencies that the school is simply a good private school, or that few any longer cross the side street, or that little comes from the school by way of research or publication, the fount of funding is apt to dry up. Since money is by the economists' definition a scarce commodity, it does not take too much persuasion to convince funding sources that the laboratory school is "a fad and a frill," nice to have but hardly necessary.

The dream assumed that the laboratory school would be so bright a lighthouse in the watery wastes of education as to scarcely require justification. But the reality has been that the laboratory school has had to fight for its life financially. Sometimes funds were not cut off, yet little more than maintenance was provided. As a result, in some schools financial malnutrition developed, resulting in virtual death without proper burial.

The Burden of Multiple Purposes and Variant Perceptions

It is little wonder that in a situation of conflicting functions and variant perceptions, laboratory schools struggled to achieve identity. Occasionally, by careful delimitation, clarity of leadership, and favorable surrounding circumstances, a laboratory school became preeminent in its time. Examples cited always included the famous Laboratory School of the University of Chicago at the turn of the century under the leadership of John Dewey. To cite others in this paper would lead to controversy among my listeners or readers and divert their attention from the burden of my address. Suffice it to say that I have my little list of laboratory schools that were or are outstanding—and so do you.

But the burden of multiple purposes and variant perceptions was heavy for many laboratory schools. Some settled for being all things to all men. To borrow from the language of sociology, the laboratory schools often "accommodated." Genuine experimentation in the students' programs was accompanied by the persistence of the study of Latin and of formal grammar in the curriculum. Parents sanctioned some experimental work and a high degree of teacher-in-training activities through an unspoken trade for assurances that the student would be qualified for the college

of his choice. The doors were opened to student teachers, participants, and observers. Somewhat more uncertainly, the researchers were assured that they too would be welcome, should they desire to come in and if they promised not to get in the way of "good teacher." Laboratory school teachers are occasionally reminded of their broader roles while essentially remaining undisturbed in their comfortable and accustomed roles as good teachers. Funding sources were constantly assured of the significant contribution to teacher education of the laboratory school while public relations attempts were made to discredit whispers, valid and invalid, which questioned the school's contribution.

The Laboratory School Administrators

A few laboratory school administrators became giants in the teacher education profession. They managed to combine skillful and successful administration and supervision of their school with carrying on their own independent research, writing their books on education, serving as consultants to school systems, delivering addresses at national conventions, etc. Eventually, they retired to schools of education where, presumably, their benign wisdom was respected by all. But the number of such laboratory school super-administrators has never been legion.

Some laboratory school administrators (and there are those that would say most) found that their time and energy had to be fully committed to acting as mediators or brokers among the conflicting functions and variant perceptions of groups. Their professional life was a constant shuffling among daily differing demands of students, parents, professors, college and university officials, laboratory school teachers, and funding sources. Their role was that of the man in the middle. They were the eternal reconcilers. They often responded with accommodation. Even so, they sometimes found that nobody really loved them—except, possibly, their families and their dogs.

Trends Affecting Laboratory Schools

So, throughout the twentieth century, laboratory schools have been a part of teacher education. They have been born. And some have died. New ones have been born. Sometimes that have reached heights of eminence; sometimes they have simply endured.

Meanwhile, education continued to change. Two contemporary trends have particular significance for the laboratory school. Increasingly, the public schools are the locale of student teaching or extensive research. Increasingly, the innovations in education come from massive projects financed by national government or by foundations. Decreasingly do the significant innovations come from the laboratory school.

The Decline of Student Teaching in Laboratory Schools

We had best bear in mind that student teaching as a laboratory school function is in decline but is far from disappearing. Kelley reported in College Controlled Laboratory Schools in the United States—1964 as follows:

> Respondents from 186 institutions provided information regarding the relative importance of the seven possibly laboratory schools functions listed on the survey questionnaire. For the total group the functions were ranked in the following order of importance:
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> | | |
> |---|---|
> | First | Observation |
> | Second | Demonstration |
> | Third | Student Teaching |
> | Fourth | Participation |
> | Fifth | Experimentation |
> | Sixth | Research |
> | Seventh | In-Service Training |
>
> In spite of the attention which has been given to the importance of research and experimentation as unique functions of laboratory schools, only twenty-seven (27) institutions listed either of these two functions as of first importance in their schools. On the other hand, sixty-two (62) institutions reported that student teaching is the most important teacher education functions of their laboratory school.[5]

As late as 1958, Duance E. Lang reported in Educational Administration and Supervision[6] that his study of 75 laboratory schools indicated the majority of laboratory school principals queried (70.7%) still regarded student teaching as the school's primary function. Demonstration and observation was regarded as a dual primary responsibility by almost half of the principals. Experimentation as a primary function was of little importance and as a secondary function had wide surface support but small actual application.

In 1959 Otto Hughes reported in the Bulletin of the School of Education, Indiana University, in a study of 31 laboratory schools, that the major roles were (in order) student teaching, research and experimentation, observation and participation, and demonstration.[7]

So, the decline, rather than disappearance, of the once primary function, student teaching, can be documented. The decline in student teaching in laboratory schools is readily understandable. It grew out of such social forces as the growth in population and the consequent sharp increase in the number of teachers required. It also grew from a decision by many educators when confronted with the dilemma of whether to educate teachers in training as to "the best" or as to "the most real." Presumably the laboratory school was "the best." But, given a student body skewed to upper income, brightness and problem proneness, given what appeared to many visitors from the public schools to be easy access to materials and resources, given proportionately more staff members to work with students, and given sometimes differing curriculum organization or administrative methods, the laboratory school was not perceived as "the most real." So many educators chose the "reality" of the public school system as the better experience for potential teachers.

With the onerous responsibility of providing for student teaching reduced, laboratory schools should have been more free to stress their functions of demonstration, good teaching, observation, participation, experimentation, and research. However, some inhibiting factors described earlier in the description of conflicting functions and variant perceptions remained.

As James B. Jackson pointed out in the Journal of Teacher Education in 1967, the cluster of functions comprising observation, participation and the remaining student teaching was given more emphasis than the cluster of functions including research, experimentation, and in-service education. Jackson attributes this to students and professors being more involved in the former cluster, the difficulties in achieving the latter cluster, the objections of parents to guinea pig roles for students, and the fact that laboratory school staff members are busy enough with pre-service education.[8]

A.R. Gaskill and A.A. Carlson pointed out in "Is the Campus Laboratory School Obsolescent?" that the laboratory school could not do well with all of the mutually exclusive objectives and that present demands consequently exceeded present facilities and abilities.[9] John F. Ohles in "The Laboratory School: Unsolved Problem" showed that integration of laboratory experiences with college instruction was difficult for both laboratory school and college staffs because of the amount of teacher load and lack of time, failure on both sides to understand the roles of the other, status problems, and lack of contact between staffs.[10]

The Growth of Innovation Outside the Laboratory Schools

A major difficulty in the full use of laboratory schools for the cluster of demonstration-observation-participation functions and for the cluster of research-experimentation-in-service functions developed in the 1950's. Fashions in ideas changed in a changing social context.

A shift came in American education away from the progressive education conceptions and toward the reformation of the separate subject disciplines. The background need not be retold here; it has been well described by Lawrence Cremin in The Transformation of the Schools.[11] To put it fliply, Jerome Bruner replaces John Dewey as the patron saint of post-Sputnik American educators. But the better laboratory schools from the 1930's into the 1950's has been examples of such progressive education developments as core and block-time programs, the solving of cross-disciplinary problems, creative writing, social travel, application of findings of child and youth development studies, etc.

The sponsors of massive government projects in the separate subject disciplines were funded by the national government after the 1957 Sputnik panic. The national projects picked up the ball of innovation and ran with it. Foundations, notably Ford, developed and supported new ways of organization—notably team teaching, nongraded classrooms, new school plant designs focusing on resource centers, etc. A new technology industry developed which attempted to apply the industrial revolution to education via educational TV, programmed learning, computer-aided instruction, and a variety of multimedia.

The so-called reform movement in education of the 1950's and early 1960's stemmed from other sources than the schools of education. Even more germane for our purposes in this appraisal of the laboratory school is the fact that the new curriculum reform movement of the later 1950's and the 1960's did not stem from the laboratory schools, even though the laboratory school has been conceived, by the dream of the potential contribution of the laboratory school, as a major focus (if not the focus) for experimentation and innovation in education. Not only did laboratory schools not create the new innovations—by the late 1960's many laboratory schools, handicapped by old facilities, lack of funds for expansion, and conflicting expectations, had been unable to adopt the recent innovations. Some educators stuck to their philosophical and curricular guns and refused to accept the assumption that progressive education was obsolete. The price paid for such integrity included lack of access to governmental and foundation funding. Certain foundation-selected and national government-favored public school systems came to be looked

on as the contemporary educational lighthouses. Who among us, for instance, has not heard of the programs of the schools of Lexington, Massachusetts, or of Melbourne, Florida?

On Natural Enemies and Natural Friends

So, in the late 1960's, as reconstruction of separate subject disciplines persists (though slowing down), as technology booms, and as the problem of urban areas and black dissent approaches crisis, the stage is set for action by the natural enemies of the laboratory school.

The Natural Enemies

The concept of natural enemies is a familiar one in the animal world. The dog and the cat, for instance, provide a homely illustration of natural enemies. The laboratory school, too, has had its natural enemies, however, benign their appearance—for instance, the laboratory school student who rejects the education he received, the parent perceiving the school as another private school, the professor of education indifferent to the laboratory school, the budget-cutter in the legislature or in the university governance hunting for cost reductions and lowered taxes. Strangely enough, the laboratory school sometimes has natural enemies within its own building—the laboratory school administrator who always accommodates and never leads, and the narrowly focused laboratory school teacher who rejects all functions save teaching.

To these natural enemies of the laboratory school still another has been added in our times. With the development of projects and research financed by national government and foundations and with the shift in curricular innovation to the public schools, a new type of professor and administrator in teacher education has come to the fore. The new-type educator is committed to research in his own study or in university libraries. His laboratories are the school systems of the land. The new professors assiduously seek funds from governments, foundations, and university sources. Proponents of the laboratory school must face the unpleasant fact that many among the new type of professor and administrator in teacher education genuinely believe the laboratory school to be obsolete, passe, a dead duck. Many sincerely believe that funds now expended for laboratory schools would be better invested in their own research and projects.

I know of no scholarly study of the termination of laboratory schools by some colleges and universities in America. But I venture as a hypothesis that when such studies of termination—the correct diplomatic expression used is "phasing out"—are made, a rising new type of professor and administrator in teacher education will prove to have been one of the most effective natural enemies of the laboratory school. Caesar, you will recall, was put to death by his colleagues, who included the noble Brutus.

The Natural Friends

If the laboratory school has natural enemies, who are its natural friends? They should include those community influential who were pleased with their own education in the laboratory schools. They should include the parents who want their children to have better education than that which the conventional school can supply, and believe that the laboratory schools provide such education. They should include the professors of education who do continue to cross the street with their students and their research programs. They should include the statesmen among legislators. And, of course, the natural friends of the laboratory school should include its broad-visioned teachers and its leadership-oriented administrators. The latter should be the best and most active friend of the laboratory schools, for the work of such schools is their professional commitment, their professional life.

One would think that such friends of the laboratory school would be thoughtfully engaged in reexamining the dream of the laboratory school and in realistically redefining and adapting the functions and purposes of each individual laboratory school to contemporary realities. One would think that such friends of the laboratory school would be engaged in radical and searching study and action to achieve a representative student body. One would think the friends of the laboratory school would be clarifying relationships and actively fostering cooperation between school of education staff members and laboratory school staff members. One would think that the friends of the laboratory school would be urgently demanding the funds and staff to exemplify in the laboratory school the best possible education for children and youth. One would think the friends of the laboratory school would be identifying the appropriate frontiers for the laboratory school today. For instance, in a world of disproportionate emphasis on temporarily favored subjects, one would think the friends of the laboratory school would create balanced programs which adapt the projects and innovations to a progressive philosophy.

But I doubt that many friends of the laboratory schools are so engaged on behalf of the laboratory school. Even many teachers and administrators of laboratory schools do not seem to be so engaged. Possibly historians of the year 2000 may record that the laboratory school was not killed but that its friends yielded to the death wish and committed suicide without putting up a fight for life. Or will they attribute the fall of the laboratory school to blindness?

But let us hope instead that the historians of the year 2000 will chronicle the laboratory school as a flourishing and healthy part of the developing teacher education. Let us hope that some version of the dream, reexamined and redefined through reconstruction of experience, may yet prevail.

A Time for Choice

The choice seems clear. The friends of the laboratory school will either learn from the past and build a better laboratory school for the late twentieth century based on a reconstructed dream, or the friends of the laboratory school will carry on business as usual as the laboratory school, marked by conflicting purposes and varying perceptions, drifts toward extinction through internal neglect and external assault.

Footnotes

1. E.I.F. Williams, The Actual and Potential Use of Laboratory Schools (New York: Bureau of Publications, Teachers College, Columbia University, 1942); p. 218.
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9. A.R Gaskill and A.A. Carlson, "Is the Campus Laboratory School Obsolescent?" School and Society, March 1958, pp. 106-7.
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